STUDENT BELONGING AND SELF-BELIEFS

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Abstract

This study explores the disparities in academics, belonging and self-efficacy among middle school students in an increasingly economically and ethnically diverse suburb. Belonging, the degree to which one sees herself or himself as socially connected within an environment (Walton & Cohen, 2007), and self-efficacy, the belief in one's capability to successfully complete a given task (Bandura, 1997), are identified as constructs to leverage in an effort to maximize academic outcomes for all students, especially students of a low socioeconomic status (SES). An intervention aimed at improving belonging and self-efficacy for this eighth grade cohort resulted in no treatment effect at this time using these instruments; a positive effect on Self-Efficacy for Academic Achievement within the control group was found. Analysis of student responses to open-ended questions unveiled some unexpected themes, most prominently that concerns about academic workload weigh heavily on the minds of students. Recommendations for future research and implications for practice are shared.

Keywords: middle school, self-efficacy, belonging, low socioeconomic status, grade point average, affective learning, academic outcomes.

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Chapter 1

The ideal of the American Dream is that all Americans share equity in opportunity, and through hard work and sacrifice an individual can improve their lot in life. However, realistic attainment of this Dream for students from poor backgrounds is questionable as people of a low-socioeconomic status (SES) often have very different outcomes than those from middle or high-income backgrounds, including poorer health, lower income, and less work opportunities as adults (Duncan, Kalil, & Ziol-Guest, 2013). SES is also a powerful predictor of various forms of academic outcomes (Lam, 2014; Farah et al., 2006; Noble, Norman, & Farah, 2005), as the relationship between socioeconomic disadvantage and educational disadvantage has been recorded over many years (Sullivan, Ketende, & Joshi, 2013; Feinstein, 2003; Halsey, Health, & Ridge, 1980). Examples of this include lower early cognitive scores for students of a low-SES (Sullivan, Ketende & Joshi, 2013) and a vocabulary and background knowledge gap upon entering kindergarten (Wright & Neuman, 2014).

Further, the literature documents other content-specific disparities. Students from low-SES backgrounds typically enter kindergarten with poorer math skills and will go on to perform worse on standardized math assessments as compared to their more affluent income peers (Crane, 1996; Lee & Burkham, 2002). These gaps remain when students enter ninth grade, with any compensatory role that schooling plays during the pre-high school years for low-SES students offset by the lack of available summer learning opportunities (Alexander, Entwisle, & Olson, 2007).

Educational interventions for students of a low-SES, which is also referred to as *low-income* or *students in poverty* in the literature and is defined in this study as those students qualifying for free and reduced lunch via federal guidelines (United States Department of Agriculture, 2015), may be one way to help break the cycle of poverty and afford students from disadvantaged backgrounds opportunities to succeed. This dissertation explores the non-cognitive factors that contribute to a student's learning and the accompanying interventions aimed at strengthening these constructs.

1.1. Problem of Practice

Students of a low socioeconomic status (SES) at a middle school one hour north of New York City (Obama Middle School) demonstrate lower academic outcomes in the form of grade point average (GPA) and standardized reading and math scores compared with their middle and high-income peers (see Chapter Two). As a point of further comparison, students from a low-SES background at Obama Middle School also report lower scores of belonging and self-efficacy. This finding is consistent with what is seen in the literature, as students of a low-SES experience decreased belonging (Sari, 2012) and self-efficacy (Wiederkehr, Darnon, Chazal, Guimond, & Martinot, 2015). Given that belonging has proven to be a malleable factor that contributes to academic intellectual achievement (Walton & Cohen, 2007) and self-efficacy has repeatedly been shown to be a consistent predictor of student learning (Zimmerman, 2000), it is hypothesized that the leveraging of these constructs through a targeted intervention will result in improved academic outcomes for students at Obama Middle School.

1.2. Theoretical Framework

Cognitive factors, such as intelligence, have long taken a dominant role in the discourse pertaining to successful academic outcomes. More recently however, the interconnectedness between cognitive and social-emotional factors, and the role of that interplay in student learning, has gained increased prominence (Jones & Bouffard, 2012; Humphrey, Curran, Morris, Farrell & Woods, 2007). Brain science assists in further illustrating the interrelation of cognition and emotion. One example is the primary role that the limbic system, the area of the brain associated with emotion, plays in the release of dopamine, which is one of the central neurochemicals involved with cognition (Immordino-Yang & Damasio, 2007; Humphrey et al., 2007; Ljungberg, Apicella, Schultz, 1992; Schultz et al., 1995). The hard science has proved what good educators have believed for years, which is the way in which a student perceives themselves in an academic setting influences how they will perform in that setting.

Social cognitive theory proposes that human learning results from interactions between personal factors, behaviors, and environmental conditions (Bandura 1986, 1997). Bandura (1986) termed this interaction Triadic Reciprocal Determinism, and argued that all three of these factors interact with and influence one another. Specific mutual interaction between causal influences can vary depending on the task or activity presented and play a role in academic outcomes. For example, personal cognitive factors such as prior knowledge, personal affective factors such as self- beliefs that an individual brings to a task, and environmental conditions such as implicit and explicit messages a school/teacher/curriculum sends ,may influence the learner's ability to succeed.

It is within this vein that we examine the relationship between the personal, non-cognitive factors of belonging and self-efficacy. As considered within the framework of triadic reciprocal determinism, the process in which these constructs interconnect with each other and other

elements, is iterative, gradual, and dynamic. The recursive nature at play anticipates that belonging and self-efficacy both shapes and is shaped by outcomes such that a low level of either or both can lead to increasingly worse results. Inherent in this interplay is that students with a low sense of belonging or self-efficacy interpret failure as something telling about themselves, not as an opportunity to improve or another way to learn. Any indication of a lack of success or a struggle to achieve sends a message to the learner that this classroom, course, or school is not a place that they belong or are capable of doing well in.

The learner both cognitively and physically works within the environment and through the interconnectedness of thinking, feelings, and actions in order to make meaning of new information (Gee, 2008). Since students operate in a socially constructed environment with socially constructed hierarchies (Vygotsky, 1978), and since social interactions contribute to cognitive development (Goodenow, 1993), it is a reasonable and timely question to ask where students from low-SES backgrounds see themselves on this social ladder and how this perceived social positioning impacts how they operate in an academic environment. Self-efficacy concepts have been developed within the broader theoretical framework of social cognitive theory.

To understand the current outcome disparities between students of a low SES and their peers from higher SES circumstances, social cognitive theory suggests it is valuable to investigate the role of personal factors, including the self-beliefs of belonging and self-efficacy. The reciprocality at play further supports the snowball-effect described above in which a learner has a belief in how well they can accomplish a task, and messages from the environment reinforce and inform that belief. The theoretical underpinnings of both self-efficacy and belonging strengthen the position that human beings hold beliefs about where they belong within

a social structure and how they are able to operate within that structure. These beliefs influence their behaviors and choices and provide a perceptual filter that results in a predictive model about why things happen the way they do. This concept holds a special significance for students from a low-SES background, as poorer academic outcomes for this portion of the population is not just about cognition and can vary based on task and the environment. The compilation of these theories shows that self-efficacy and belonging are reasonable constructs to target in an effort to improve academic outcomes for low-SES students.

1.3. Self-Efficacy

The first construct explored that is tied to academic outcomes is self-efficacy. Self-efficacy, the belief in one's capability to successfully complete a given task (Bandura, 1997), has been repeatedly and consistently shown to influence academic outcomes (Schunk, 1991). Bandura (1977) hypothesized that an individual's efficacy determines how much effort will be put forth, what strategies and behaviors will be utilized, and how long this effort and behavior continue when confronted with a challenging task. Of the various kinds of self-efficacy, student self- efficacy will be the focus of this research.

In the context of academic learning, self-efficacy is shaped by an ongoing process in which the learner continually assesses a given task through the lens of her/his self-perceived abilities. Self-efficacy is task and/or content- dependent (Gist & Mitchell, 1992) and is also influenced by one's environment and other contextual factors. As a result, one's self-efficacy beliefs are susceptible to change based on task and/or content (Pajares, 1996), and can vary at different points in time due to changes in circumstances. Very often an individual will possess high self-efficacy in one domain and low to average self-efficacy in another. For example,

students may demonstrate a high degree of self-efficacy in a content area, such as English, but not in mathematics. Or, a student may present with high efficacy on a written task but that efficacy will not transfer to an oral presentation.

Goal setting and situational factors impact the learner while she or he engaged in a given task. Motivation allows for a learner to persevere with a task, and while engaged if the learner feels successful, motivation improves. Self-efficacy is maintained or bettered once a task of a particular type and/or context is completed thoroughly and correctly (Bandura, 1977). The approach employed by a high-efficacy learner will allow for increased time, effort, and critical engagement with a challenging task and leads to a greater chance of successful academic outcomes as compared with a low-efficacy learner.

1.3.1. Factors Influencing Self-Efficacy

Self-efficacy has been shown to be something that developmentally changes over time, is malleable, and can be influenced by explicit interventions. Self-efficacy is a construct that affects behavioral change (Schunk, 1991), and since behaviors impact academic outcomes, understanding the factors that influence behavior is essential. Self-efficacy is developed from four sources: actual past performance (also known as mastery experiences in the literature), vicarious experiences, forms of persuasion and physiological reactions (Schunk & Meece, 2006). Academic outcomes can be influenced by any of these sources either singularly, or through some combination of two or more, depending on the task and the learner. The bidirectional relationship between these sources is illustrated in Figure 1.1.

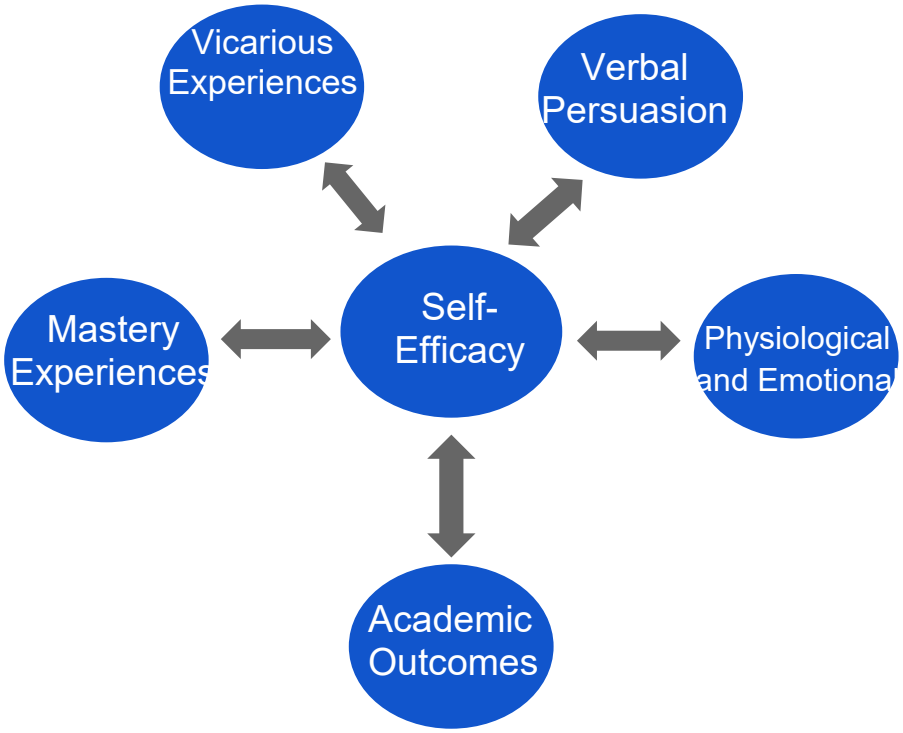

Figure 1.1

Factors Influencing Self-Efficacy

The first factor influencing self-efficacy is mastery experiences, otherwise known in the literature as performance accomplishments and categorized as previous success on a given task or in a particular context (Bandura, 1977). Academic achievement is a manifestation of mastery experience, and research suggests that self-efficacy and academic achievement have a reciprocal effect on one another (Arslan, 2013). There is a multitude of research that supports the improvement of self-efficacy with prior successful performance of a given task. One example is a study conducted by Chen and Usher (2013) with 1225 middle and high school science students. The researchers aimed to determine which aspects of self-efficacy were most prevalent in the domain of science and to what extent those aspects impacted academic performance. While the researchers found that students with multiple aspects of self-efficacy (a combination of two or

more of vicarious, mastery, verbal persuasion, and/or physiological/emotional states) had the highest levels of self-efficacy and corresponding academic performance, mastery experience alone was the single greatest component of self-efficacy and academic achievement.

Vicarious experiences have been explored as one driver of self-efficacy, with the literature providing mixed results of its potential role. One study showed no effect of vicarious experiences (one of the two sources of self-efficacy examined in their study) on improved self-efficacy (Wright, O'Halloran, and Stukas, 2016). The authors utilized psychological performance enhancement techniques (PET's), which were designed to improve aspects of performance through tasks such as modeling, imagery, motivational, and knowledge-of-results (KR) feedback. The improvement in performance was most likely due to the increased practice by participants during the two trials. Another study ended with similar results. Kudo and Mori (2015) divided 159 seventh graders into two groups and gave them separate math problems with two varying levels of difficulty. The students who received the easier math problems were partnered with students with more challenging problems. The students with the easier problems were told to work on their problems while the students with more difficult problems cheered them on. Upon successful completion of the easier math problems, the vicarious experience of success was applied to the more difficult problems, as the researchers asked students to then complete their own. There was no increase in self-efficacy for the students who cheered on the students with easier math problems, showing that a vicarious experience of success was not effective in improving self-efficacy. However, the students who were successful in completing the easier problems and earned the social approval of their peers had improved self-efficacy scores, demonstrating that mastery experience does improve self-efficacy.

Verbal persuasion, also known as social persuasion in the literature, is the next factor to influence self-efficacy and as a result, academic outcomes. In the study also cited in the previous paragraph, Wright et al. (2016) found that motivational feedback and (KR) feedback were the only PET's that improved self-efficacy. Increased self-efficacy scores were related to increased task performance scores, with the PET's being effective due to their ability to increase self-efficacy. This is relevant in that self-efficacy was improved through motivational and KR related feedback. This partially supports Bandura's social-cognitive theory in that verbal persuasion can improve self-efficacy. For entering middle school students, Usher and Pajares (2006) found verbal persuasion for females and vicarious experiences for males to be predictors of self-efficacy, with both groups also demonstrating mastery experiences as a significant predictor. Mastery experiences as a reliable predictor and contributor to perceived self-efficacy appears to be a common thread throughout the literature.

Physiological and emotional factors is the final source of self-efficacy as outlined by Bandura. A qualitative study by Usher (2009) examined the way in which students form their mathematical self-efficacy according to Bandura's four sources. Eight middle school students were chosen for in-depth interviews based on the lowest and highest score on previous quantitative self-efficacy measures. Through the interviews it was discovered that all students felt at least some short-lived physiological and affective arousal pertaining to math, but only students with a low self-efficacy viewed this in a negative light (Usher, 2009). Bandura (1997) stated that the degree of arousal can either be productive, as is the case with moderate arousal, or a high degree of arousal can disrupt academic functioning. Students with high mathematical self-efficacy leveraged the heightened state of arousal to improve their academic performance, while students with low self-efficacy impeded their functioning (Usher, 2009). Lyons and

Beilock (2011) demonstrated that part of the reason for the variance in math performance within high math anxious (HMA) students was due to the ability of the higher performing HMA's to control their negative emotional responses to math stimuli. The researchers utilized functional Magnetic Resonance Imaging (fMRI) to determine which areas of the brain were engaged in math solving behaviors and found that the successful regulation of math performance deficits were initiated before math processing even occurred. This is powerful evidence that the effective regulation of the emotional and/or physiological state can improve academic outcomes through the enhancement of perceived self-efficacy.

1.3.2. Self-Efficacy and Learning Processes

There are additional aspects of self-efficacy theory that are relevant and applicable to middle school-age students and their academic outcomes, and those are the processes impacted by perceived self-efficacy: cognitive, motivational, affective, and selection (Bandura, 1993). These processes can work in concert with one another to varying degrees or can be individually applied, due to the task-specific nature of efficacy. These processes are depicted in Figure 1.2.

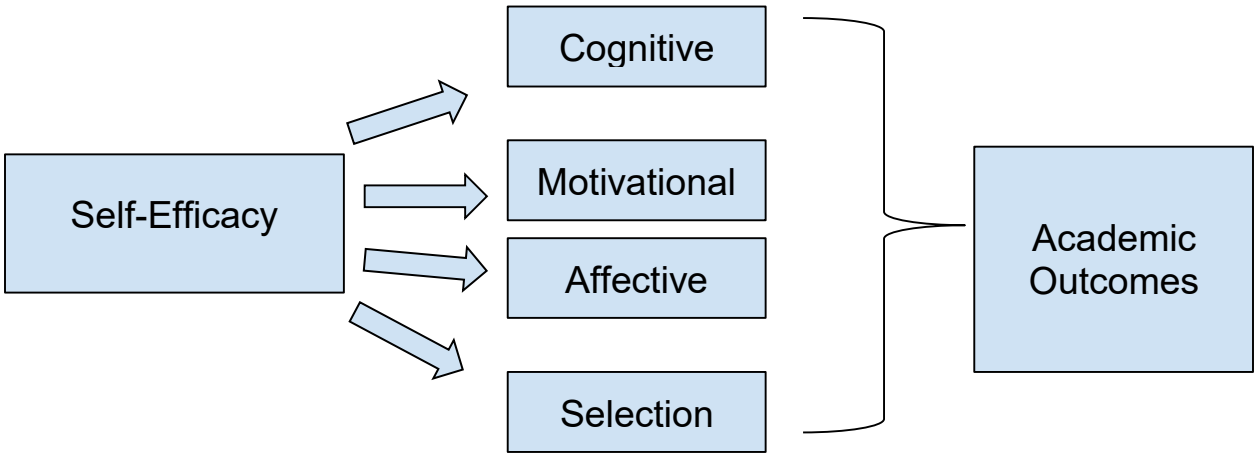

Figure 1.2.

Learning Processes Impacted from Perceived Self-Efficacy

1.3.2.1. Cognitive

The concept of what an individual is capable of is initially constructed through a cognitive process influenced by self-efficacy (Bandura, 1993). If a person has a high degree of self-efficacy, that person will envision successful outcomes at the outset of a task. A person that has low self-efficacy will struggle to imagine success and will likely flail while unsuccessfully attempting to complete the task. Additionally, the cognitive domain of self-efficacy pertains to the way in which a person views ability, either as a fixed trait or as an acquirable skill that can continuously grow. Students who see ability as something innate often do not respond well to mistakes or initial failure, while students who see ability as a skill that can be improved will view mistakes as learning opportunities that assist them in attaining their goals (Bandura, 1993). The higher a learner's perceived self-efficacy, the more that learner maximizes his or her cognitive capabilities. Learners who make the most of their abilities are able to apply tools and strategies to persevere through difficult tasks (Zimmerman, 2000). For students who have comparable levels of cognitive skill, intellectual performance differs based on their self-efficacy, with learners possessing a higher degree of efficacy performing at an intellectually higher level (Bandura, 1993). While self-efficacy is typically viewed as task or domain specific capabilities (Bandura, 1997; Pajares, 1996), academic self-efficacy refers to the generalization of a learner's belief that they can successfully complete an academic task or reach a specific academic goal (Bandura, 1997; Eccles & Wigfield, 2002; Linnenbrink & Pintrich, 2002). This generalized sense of academic self-efficacy has the potential to be transferred from one content area to another based on previous experiences, aptitudes, and social supports (Schunk, 1995).

1.3.2.2. Motivation

The next tenet of Bandura's (1986) self-efficacy theory is its impact on motivation, and within motivation, the effort that a learner applies to a given situation is a result of a learner's self-efficacy. The rate of performance and expenditure of energy are predictive measures of students' effort (Zimmerman, 2000). Skaalvik, Federici, and Klassen (2015) examined the impact of motivation (effort, persistence, help-seeking behavior, and intrinsic motivation) on mathematical achievement. The results showed grades were positively associated with all motivational aspects, with effort less so than persistence and intrinsic motivation.

Bandura (1993) explains that a preconceived notion as to what one is capable of will frame the desired end goal, and through the self-regulation of motivation, an individual will aim to achieve that goal. Self-efficacy has been shown to influence the key indicators of academic motivation noted below in a positive manner by playing a causal, antecedent role (Zimmerman, 2000). Zimmerman, Bandura, and Martinez-Pons (1992) utilized path analysis procedures to determine this causal role in relationship to academic attainment in a social studies class. The researchers found that self-efficacy in academic achievement explained 31% of the variance in social studies grades.

Further, there are three forms of cognitive motivators and corresponding theories associated with self-efficacy: causal attributions (attribution theory), outcome expectancies (expectancy-value theory), and cognized goals (goal theory). Clinkenbeard (2012) and other proponents of the attribution theory posit that causal attributions are the reasons assigned to a given task or failure, with significant influence on effort. She explains that positive attributions for success are often associated with hard work and perseverance, things that are controllable and internal, and less positive attributions associating success with external circumstances outside the

learner's control. Also, it is possible that positive attributes are associated with failure, specifically lack of effort or incorrect application of strategies, and negative attributions for failure associated with external factors, such as bad luck.

Expectancy value theorists tell us that motivation is a result of the learner's belief of the anticipated outcome and how motivated they are to achieve those outcomes (Pajares, 1996). If the learner values the expected end goal or outcome, their level of engagement will be higher as opposed to an outcome in which there is not as much value. Bandura (1986) takes this concept a step further by postulating that there is more than just the expected outcome that motivates; self-efficacy, at least in part, determines the expectations that a learner has for himself or herself. If there is a high degree of self-efficacy in a particular subject area, the cognitive frame that the learner has developed regarding the outcome will be one of success. Thus, the learner will place both a high value on a positive outcome and will place an expectation upon himself or herself that success on the task is attainable given the learner's set of competences (Pajares, 1996).

Another aspect of motivation is goal theory. This theory emphasizes the capacity of the learner by challenging himself or herself to set goals that are demanding yet attainable, and to assess progress relative to those goals (Bandura, 1993). Locke and Latham (1990) point to the importance of setting clear and challenging goals, as research has shown that doing so results in improving and maintaining motivation. Cognized goals exist in the present state and engage a cognitive evaluation process (Bandura, 1993).

For students who have low academic self-efficacy, examining how academic failure impacts motivation is an important consideration. Ohrtman and Preston (2014) assessed motivation, general self-efficacy, and academic self-efficacy with at-risk high school students in grades 10-12 across three schools. The General Self-Efficacy Scale (GSE) was used to measure

the general self-efficacy of individuals. The Academic Self-Efficacy Scale (ASES) gauged perceived ability in academic skills and strategies, and the third questionnaire was the Academic Motivation Scale (AMS) measured motivation. The researchers were able to provide adequate reliability measures for the GSE and the AMS, but not for the ASES. Multiple regression analysis was employed "to predict the value of classes failed (dependent variable) by exploring students' perceptions of general self-efficacy, academic self-efficacy and motivation (independent variables)" (p. 31). Surprisingly, at-risk students did not show lower measures on any of the three scales, which could have been for many reasons, such as a history of academic failure that minimizes the impact of receiving a failing grade or an accurate depiction of their demonstrated capabilities.

1.3.2.3. Affective

The third process impacted by perceived self-efficacy falls within the affective domain. "The emotional mediator of self-efficacy belief" (Bandura, 1993, p. 132) speaks to a learner's beliefs in his or her own ability to manage stress and anxiety. Someone with a strong sense of affective efficacy is able to handle threatening or stressful situations, and someone with a low sense of efficacy focuses on their inability to cope, imagines the worst case scenario, and practices unproductive and feckless thinking (Bandura, 1993). Stress, anxiety, and depression are some of the factors that can be mediated by a learner's self-efficacy (Bandura, 1997). Pajares and Kranzler (1995) conducted a study in which self-efficacy and the mathematical anxiety of students was examined. The results demonstrated a negative correlation between self-efficacy and anxiety. Also, self-efficacy was found to be a predictor of mathematical performance. Griggs, Rimm-Kaufman, Merritt, and Patton (2013) also showed that anxiety contributes to poor self-efficacy in math and science.

1.3.2.4. Selection

The final process influenced by perceived self-efficacy is selection. Beliefs of self-efficacy shape the decisions that a learner makes, and allows the learner to select environments and paths that he or she believes they will be successful in. Learners invite activities within their scope of self-efficacy related skills and avoid situations in which their efficacy does not reach (Bandura, 1993). One example of the selection process is career choice. The stronger a learner's efficacy, the more likely he or she is to show interest in various types of occupations. If this interest exists, the more likely they are to perform well academically in school in order to prepare themselves and to stay in an occupation that is challenging (Bandura, 1993).

Learners with high self-efficacy partake in demanding tasks more willingly than learners with low self-efficacy and are more likely to persevere when a given task that is challenging (Zimmerman, 2000). High self-efficacy has been intimately associated with choice and effort when presented an academic task (Wolters & Hussain, 2015; Pajares, 1996; Zimmerman, 2000). Individual distinctions in self-efficacy have shown to be better predictors of performance than former achievement or previously demonstrated ability and take on even more importance when people face adversity (Cassidy, 2015). A wealth of research indicates that self-efficacy correlates with achievement outcomes (Bandura, 1997; Pajares, 1996; Schunk, 1995). Self-efficacy affects achievement directly and indirectly through its influence on goals (Zimmerman & Bandura, 1994). Linnenbrink and Pintrich (2003) found that when considering all of the motivational constructs, self-efficacy is the one that is essential to furthering and maintaining student learning and engagement. Additionally, Shell, Murphy, and Bruning (1989) showed a link between self-efficacy and reading and writing achievement, further strengthening the connection between academic outcomes and self-efficacy.

1.3. Belonging

The second major construct tied to academic outcomes explored in this study is belonging, defined in this research as the degree to which one sees herself or himself as socially connected within an environment (Walton & Cohen, 2007). Belonging serves as a key predictor of several outcomes, including academic motivation and achievement, and several facets of well-being (Shochet, Smith, Furlong & Homel, 2011). The extent to which one feels as though they belong is positively associated with life satisfaction, physical health, cognitive performance, and academic outcomes, and is negatively associated with clinical depression (Allen & Bowles, 2012). Feeling as though one belongs is "a fundamental human need" (Walton & Cohen, 2011, p. 1447) and a high degree of belonging is predictive of positive results (Walton & Cohen, 2007). In a nationally representative sample of over 12,000 students, belonging in school was determined to be one of the two most reliable and effective factors (family connectedness being the other) against every form of adolescent risk, including emotional distress, suicidal thoughts, violence, and substance abuse (Resnick et al., 1997). Additional studies suggest that school belonging can predict future negative affect, even after controlling for initial symptoms (Shochet et al., 2006). The authors found a correlation between school connectedness and overall functioning, depression, and anxiety symptoms at two different points in time. Further, Lester, Waters, and Cross (2013) examined the causal pathways between connectedness and depression, and connectedness and anxiety, from grades seven to nine. The researchers determined that there is a reciprocal relationship between increased depression and decreased school connectedness for females. For males, increased depression was associated with decreased connectedness. Finally, Hale, Hannum, and Espelage (2005) proved that belonging forecasted better health perceptions for women and fewer physical symptoms for men among a sample of 247 college students.

Although the research in this study is focused on academic outcomes, the aforementioned research is shared as a way to convey the importance of belonging as a construct beyond purely academic purposes.

1.3.1. Historical Development of the Belonging Literature

Over time the definition of belonging, the way in which it is measured, and the accompanying verbiage that describes the construct has been divergent and is one reason for a lack of implementation in school settings (Allen & Bowles, 2012). Table 1.3 provides a succinct summary of these related terms, although further elaboration is needed to understand the various ways in which this construct has been classified throughout the literature and how the meaning and use has evolved to the more-widely recognized term, belonging.

Researchers have varied in the actual naming of the construct, or agreed with the term but gave their own definition. Beginning with a pioneer in belonging research, Goodenow (1993) defines 'belonging' as the degree to which a student feels part of the school community through acceptance, respect, inclusion, and support on a personal level. Several other authors use this definition of belonging although using different terms: 'school connectedness' (Shochet, Dadds, Ham, & Montague, 2006), 'school belonging' (Shochet et al., 2011), and 'belongingness' (Vaz et al., 2015). Gillen-O'Neel and Fuligni (2013) explicitly discuss the variability that exists for the term 'belonging' and the lack of a singular term throughout the literature. Conversely, others have agreed on the term but differed on the definition. One example is referring to students who are "discernibly part of the school environment and that school constitutes an important part of their own experience" (Finn, 1989, p. 123). Voelkl's (1997) definition is "An internal sense that one is an important part of the school environment and that school is an important element in the one's personal experiences" (p. 296).

Researchers have also shared their findings or thoughts on constructs that differ in name and definition but are undoubtedly related. 'School membership' is a sense of ownership of the school program built through social relationships (Wehlege, Rutter, Smith, Lesko, & Fernandez, 1989), with high school membership sense reflecting contributions among four elements: (a) attachment, investment in positive relationships; (b) commitment, agreement with the parameters set forth by school officials; (c) involvement, as an active member of the school community; and (d) belief, trust in the school as an organization. The authors theorize that through the interaction of these four elements, trust can be built, leading to improved academic engagement, which in turn provides for the best chance for the academic and social-emotional growth of students. Others have explored a set of similar dynamic relationships using the term 'school connectedness', meaning the extent to which one feels part of a school, has relationships with others, and feels as though teachers treat students fairly (Resnick et al., 1997). Academic belonging is defined as the view of one seeing themself as 'fitting in' to an academic environment (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012). Despite the variance, the commonality that they wish to assure us with is that all terms focus on the social and emotional connections to school.

Walton and Cohen (2007) have helped to bring consistency and refinement of this construct. In their work, the constructs and relationships between them are leveraged through interventions aimed at improving 'social belonging', defined as seeing oneself as socially connected. For the purposes of this research, the term belonging, defined as the degree to which one sees herself or himself as socially connected within an environment (Walton & Cohen, 2007), will be utilized. The evolution of this research from various terms and definitions to attempt to explain the same construct has come together more recently, and for the purposes of

this study allows for a streamlined view of this construct and the potential that it could have on improving student learning.

Table 1.3.

Belonging Constructs and Their Accompanying Terminology

Term	**Definition**	**Citation**	**Subjects and Context**	**Major finding / Conceptual Theory Posited**
Belonging or Psychological Sense of School Membership (PSSM).	*"The extent to which students feel personally accepted, respected, included, and supported by others in the school social environment" (Goodenow, 1993, p. 80)*	Goodenow (1993)	454 suburban middle school students, 301 urban junior high school students	PSSM quality is substantially correlated with school motivation and grades.
School Connectedness	Uses Goodenow's (1993) definition but uses the term 'School Connectedness'	Shochet, Dadds, Ham, & Montague (2006)	2,022 students ages 12 to 14 throughout Australia	Strong correlation between School Connectedness and mental health symptoms. School Connectedness also predicted depressive symptoms one year later.
School Belonging	Uses above Goodenow (1993) definition but calls it 'school belonging'	Shochet., Smith, Furlong, & Homel (2011)	273 high school students and 231 middle school students in Australia	Belonging serves as a key predictor of several outcomes, including academic motivation and achievement, and several facets of well being.
Belongingness	Also uses Goodenow (1993) definition, but adds	Vaz, Falkmer, Ciccarelli, Passmore, Parsons,	266 students who were transitioning from primary to	Those who feel as though they "belong" during their last year

	that belongingness "represents an active internal experience of a strong psychological connection" (p.1).	Black. . . Falkmer (2015)	secondary schools in Australia	of primary school carry that feeling to secondary school, regardless of SES, disability, or gender.
Belongingness	Students who identify with school, are "discernibly part of the school environment and that school constitutes an important part of their own experience" (Finn, 1989, p. 123).	Finn (1989)	Conceptual finding	The extent to which one feels as though they belong is one of many reasons that influences the decision to stay in school or to drop out.
Belongingness	"An internal sense that one is an important part of the school environment and that school is an important element in the one's personal experiences (Voelkl, 1997, p. 296).	Voelkl (1997). Related to and expanded on Finn (1989)	1,335 eighth grade students throughout all kinds of schools in Tennessee.	School achievement and participation correlate with the way in which the individual identifies with their school. In addition to Finn's premise, included feelings of respect and pride. Also cites Goodenow (1993).
School Membership	Sense of ownership of the school program through social relationships	Wehlege, Rutter, Smith, Lesko, & Fernandez (1989)	Case studies of 14 schools who intensely focused on at-risk students	The most effective schools provide a 'Community of Support'. This builds trust and academic improves engagement.
School Connectedness	Perception that teachers treat students fairly, feel	Resnick, Bearman, Blum, Bauman, Harris, Jones ... &	12,118 adolescents from the National	Perceived school connectedness was one of two factors

	a part of school, close to others at school	Udry (1997)	Longitudinal Study of Adolescent Health	that mitigated health risks
Social Belonging	Seeing oneself as socially connected	Walton & Cohen (2007)	Study 1: 69 Black and White college students in the Northeast. Study 2: 189 college students (34 minority, 155 White) 37 - 55 White and Black college students for the various stages of study 2.	Study 1: students part of the minority group possess are unsure of their sense of belonging in an academic setting. Study 2: Black students saw challenges as a lack of fitting in in an academic setting, the intervention mitigated sense of belonging as based on the adversity of the day. Also earned higher GPA's the following semester.
Social Belonging	A sense of having positive relationships with others	Walton & Cohen (2011)	92 African American and White college freshmen	Treated students demonstrated a higher GPA through their senior year, cutting the racial achievement gap in half.
Academic belonging	View of oneself as 'fitting in' in school	Cook, Purdie-Vaughns, Garcia & Cohen (2012)	361 Black and White middle school students	A values affirmation reduced a decline in GPA for African American students (Cook et al., 2012)

1.3.2. The Impact of Multiple Factors on Academic Outcomes

While single constructs have been proven to have an impact on student learning, two or more factors uniting can have an even stronger influence. Belonging and self-efficacy together

have also been shown to influence academic outcomes. Focusing on school membership as the center of school engagement, Wilson et al. (2015) focused their study on undergraduate STEM students in five geographically and culturally diverse areas. They found through survey data two things: belonging and self-efficacy in the STEM classroom is significant both together and as separate constructs in increasing student engagement (Wilson et al., 2015). Raufelder et al., (2015) agreed with the strong connection between belongingness in school and engagement and established that there should be a focus on student to teacher relationships in schools to bolster both belongingness and engagement. Hazel, Vazirabadi, & Gallagher (2013) consider belonging at school part of affective engagement and included belonging as one of three domains of student school engagement, with the other two being aspirations and productivity. There was an assumption made by these authors that the fundamental drivers of the three categories were correlated.

1.3.3. The Middle School-Age Learner

Another essential contextual component to this study is the unique developmental phase that comprises the middle school learner. Students in middle school are at a critical developmental phase, as adolescence is characterized by intense interpersonal, neurobiological, and psychosocial change (Busso, 2014). The extensive physical development and increased hormonal production that this age group experiences also has the potential to impact academic outcomes during the middle school years (Eccles et al., 1993). As adolescents mature, they also become more self-aware and cognizant of their perceived role, thus impacting social cognitive processes (Blakemore & Choudhury, 2006). Further, there is evidence that during this transformational time the brain develops and improves its connections, allowing for increased intricacy of thought (Giedd, 2009). Hardiman (2012) defines plasticity as the ability of the brain

to be altered with events. The high degree of plasticity that accompanies adolescence (Choudhury, 2010) results in the formation of habits and processes that will impact future academic outcomes. This incredible neuroplasticity results in significant opportunity for the improvement and molding of executive function and social cognition (Blakemore & Choudhury, 2006). Busso (2014) reiterates the urgency of this time period by stating, "Adolescence may represent a sensitive window in which to fortify the architecture of the developing brain" (p. 35). However, it should be noted that the areas of the brain that are responsible for decision-making are among the last of the regions to fully develop (Eshel, Nelson, Blair, Pine, & Ernst, 2007), making the full integration of the social-emotional and cognitive networks somewhat challenging at this developmental phase. With that said, an intense focus on these outcomes, including a dissection of what contributes to those results, is needed in order to assist students in attaining their academic potential.

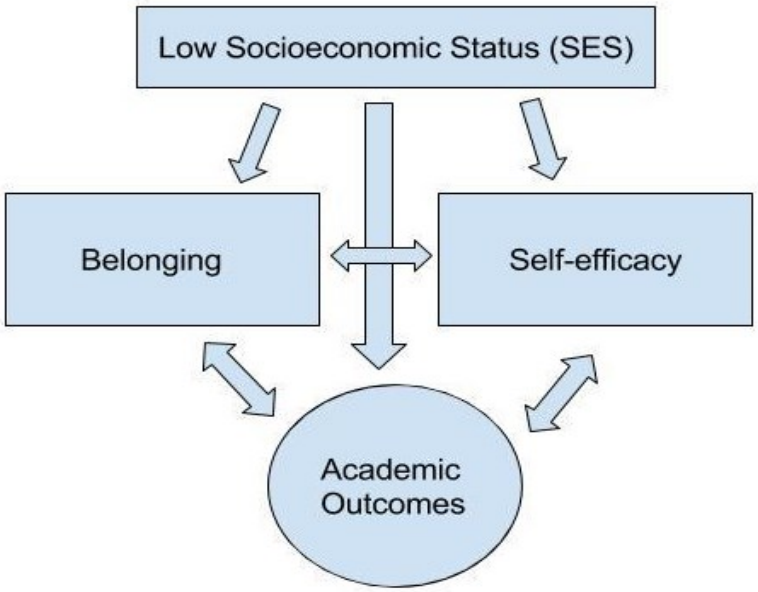

Figure 1.4.

The Relationship Between Academic Outcomes and the Influencing Constructs

1.3.4. The Connection Between Socioeconomic Status and These Constructs

The relationship demonstrated in the literature between SES, belonging, self-efficacy and academic outcomes is illustrated in Figure 1.4. Beginning with belonging, Sari (2012) found that middle and high SES students had a significantly higher sense of belonging than their low-SES counterparts. Other literature suggests that belonging can mediate SES factors on student achievement. This trend remains true on college campuses, as social class influences who "belongs" at what kind of institution (Ostrove & Long, 2007). Further, the researchers state that because belonging impacts academic outcomes, the lack of belonging for students of a low-SES results in lower academic performance and a lesser quality college experience. The characteristics that college students take with them to college, such as SES, influences their social integration, including belongingness, as well as their commitment to successfully completing college (Hausmann, Schofield & Woods, 2007).

Research also demonstrates a relationship between SES and self-efficacy. One perspective posits that students of a low-SES internalize this socio-economic standing in the form of low self-efficacy (Wiederkehr et al., 2015). However, the authors also found that a higher self-efficacy mediated any SES performance gap. Other research has discovered that the type of self-efficacy that one possesses (see earlier in this chapter for more details) can vary based on SES.

Further evidence on the relationship between SES and self-efficacy comes from Shanley (2015), who utilized data from the Early Childhood Longitudinal Study Kindergarten Class of

1998-99. Specifically focused on STEM outcomes, the researchers examined mathematical achievement growth from grades K-1 and 3-8, as well as mathematical self-efficacy development in grades 3-8. They found that after the K-1 period, SES was the only noteworthy factor that impacted both mathematical growth and self-efficacy development. Students from higher SES backgrounds showed gains in both achievement and self-efficacy, while low-SES students experienced decreasing self-efficacy at a faster rate than their typical income peers.

To conclude, the aforementioned research discusses the constructs of belonging and self-efficacy and their relationship to academic outcomes. Also discussed is how the characteristics of the learner, such as socioeconomic status or the developmental phase of adolescence, factors into student learning. The singular impact of any of these factors on student learning, and/or the interconnectedness of two or more on academic outcomes, will be examined in the practical setting of Obama Middle School. This examination will be discussed in Chapter Two in further detail.

Chapter 2

Chapter one outlined the theoretical foundation of self-efficacy and belonging, and highlighted trends within the literature pertaining to the relationship between these two constructs and academic outcomes for students. Self-efficacy and belonging are self-beliefs that an individual possesses about the world that they operate in. The dynamic at play results in students seeing struggle and failure as indicative of their ability and not belonging in an academic environment, as opposed to a typical part of the learning process. Students with a low sense of belonging or self-efficacy interpret failure as something telling about themselves, not as an opportunity to improve or another way to learn. The recursive nature at play ensures that belonging and self-efficacy both shapes and are formed by outcomes. Any indication of a lack of success or a struggle to achieve sends a message to the learner that this classroom, course, or school is not a place that they belong or are capable of doing well in. This is compounded for students of a low-SES. As a result of the compilation of this research, a needs assessment was developed and implemented at Obama Middle School in an effort to gauge the degree to which the interplay illustrated in the research exists in that setting. The extent to which academic disparities exist for students of a low-SES when compared to their middle or high-income peers, the relationship between self-efficacy and academic outcomes as well as belonging and academic outcomes, and if that relationship differs based on SES is of particular interest, is examined in this chapter to the extent possible.

2.1. Professional Context

This specific middle school, Obama Middle School, in suburban New York serves approximately 750 students in grades six through eight and approximately 3,100 students attending the four district schools grades K-12. One of the notable demographic shifts of this District over the last 10 years has been the increase in the free/reduced lunch population from 4% in 2005-06 to 26% for the 2015-16 school year (New York State Education Department, 2016). This district has also seen academic outcomes change along with the demographics. An example of this is the high school graduation rate which has shifted over time, standing at 87% for all students and 85% for low-SES in 2006 and falling to 86% overall and 73% for low-SES students in 2016 (New York State Education Department, 2016). Although this specific needs assessment takes place at the middle school, the demographics of the district are relevant in two ways: 1) the results of this chapter could inform future steps system-wide and 2) these demographic shifts do not pertain to just one cohort of students. Table 2.1 details the free/reduced lunch population by within Obama Middle School and the district's average overall. This shift in population and decline in the high school graduation rate represents a need to reexamine the psychosocial constructs related to student learning, specifically belonging and self-efficacy, as a way to improve academic outcomes for students.

Table 2.1.

Percentage of Students in Free/Reduced Lunch Program 2015-16

Sixth Grade	Seventh Grade	Eighth Grade	Overall School Average	Overall District Average
32% (n=74)	23% (n=62)	22% (n=22)	25% (n=192)	26% (n=767)

Table 2.2 outlines the specific ethnicities of all students in grades six through eight at Obama Middle School. As one can see from examining the table, the groups are consistent across sixth and seventh and eighth grades. Figure 2.3 takes this analysis a step further to disaggregate the low-SES population by ethnicity. Here it is demonstrated that while students of Hispanic descent are overrepresented when compared to the overall population, just about half of the sixth grade low-SES students come from other ethnic backgrounds. This data assists in countering a popular misnomer within teacher and some of the families within the district that Hispanic students are the only low-SES students in the school.

Table 2.2.

2015-16 Percentage of Students Enrolled in Obama Middle School by Ethnicity

Ethnicity	**Sixth Grade** (n=231)	**Seventh & Eighth Grade** (n=524)	**Overall School Population** (n=755)
White	64.5% (n=149)	66.6% (n=349)	66% (n=498)
Hispanic / Latino	26.83% (n=62)	26% (n=136)	26% (n=198)
Multiracial	1.73% (n=4)	1.52% (n=8)	1.6% (n=12)
Black or African American	3.03% (n=7)	1.71% (n=9)	2% (n=16)
Asian	3.9% (n=9)	3.98% (n=21)	4% (n=30)
American Indian or Alaskan Native	-	.19% (n=1)	.13% (n=1)

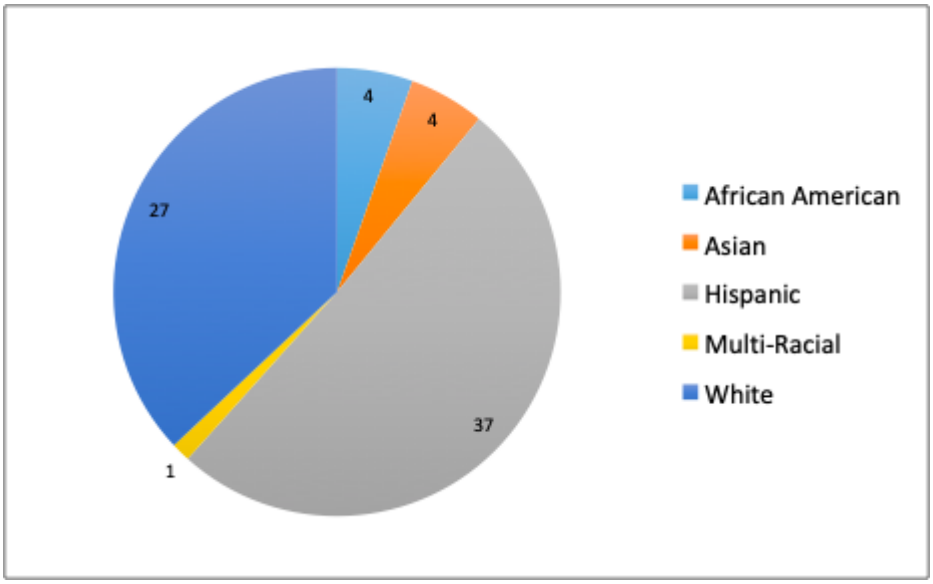

Figure 2.3.

Number of Sixth Grade Students in Poverty by Ethnicity

2.1.1. Federal and State Accountability Influencing Local Decisions

In an effort to fully understand the context of Obama Middle School and the relevant curricular and instructional decisions, a discussion of the external pressures at the state and federal levels is needed. Federal and New York State mandates have shifted the emphasis on measures of student learning to standardized assessments. In 2001 Congress passed the No Child Left Behind (NCLB) Act, which required that all students achieve proficiency in reading and math as measured by high-stakes assessments (Robinson, 2015). In 2009, the Race To The Top (RTTT) program made available $43.5 billion to states through competitive grants that incentivized implementing the Common Core Learning Standards and also required that test scores be tied to teacher evaluation (Robinson, 2015). As a result, the consequences for not meeting state and federal benchmarks have caused test scores to become the focus and goal of education (Abbott, 2013).

The focus on improving standardized assessment scores has resulted in more students being placed in remedial courses that are designed to close the gaps for the skills measured on these assessments. One such remedial class is called English 6 Skills, which students have for two periods each day. Since this is a class intensely focused on reading comprehension and writing skills, one period each day is taught by an English teacher, who serves as the content specialist, and the other period is taught by a reading teacher, who functions as the interventionist. The goal is for the intensive reading and writing supports to assist students in meeting proficiency standards and to read on grade level by the end of the school year, allowing for success in a typical English class in subsequent years.

An observation of this class conducted in 2015 produced evidence of scarcity in terms of resource allocation within a student's schedule. The structure of the class calls for an additional period three out of four days in a student's schedule cycle, as compared to an English 6 class. Since there are a limited number of periods available within a school day, this results in students taking one less elective than their typical English 6 peers. The teacher, (personal communication, February 11, 2016), reported that a discussion ensued the day prior to the observer's first visit about one student who was able to exit the class and enter English 6 due to her improved Lexile level and daily classroom performance. Based on student comments, they are aware that their former classmate is now in an English 6 class and is able to take one more elective than them. English 6 Skills students have less choice in their coursework and less opportunity to explore interests through electives as a result of their need to meet proficiency standards.

Although this particular English 6 Skills class is a small sample, the demographics within this class are of particular interest. Seven of the 19 students (36.8%) in the class are on

free/reduced lunch, resulting in a higher percentage than the school average (26%) and the sixth grade average (32%). Additionally, the ethnic composition was not representative of the school population, as 11% of the students within this remedial class were African American, as compared to the 3% average in the sixth grade. This data shows that in this particular case, not only are students of a low-SES and students of color over-represented in these courses, but they also disproportionately miss out on opportunities such as enriching or interest-based electives as a result of not meeting grade level standards. This researcher feels as though there is a moral imperative to improve academic outcomes for all students, especially students of a low-SES, so that they can more fully participate in the academic program offered at the school. Self-efficacy and belonging are examined throughout this research as potential mediating variables that can be leveraged to improve academic outcomes, especially for students of a low-SES.

2.1.2 Participants

During the 2015-16 school year there were 231 students in the sixth grade at this middle school ranging from 11 to 12 years of age. Although the academic program of a sixth grader could vary by special education classification (classified or not), advanced math or grade level math, and English as a New Language (ENL) status, all students were considered eligible for this study with two exceptions. One exception is those students who are in our Lifeskills program. These students typically have significant developmental disabilities with IQ's below 70, and do not participate in the New York State ELA and math assessments. Three students were removed from the original 231 students.

The other exception is beginner students within our ENL program who are enrolled in self-contained coursework with an alternate curriculum. Five students were removed from the remaining 228 students due to meeting this criteria, although it is desired for these students to

participate in the self-efficacy and belonging survey in order to inform local planning. There were also three students who had incomplete data, such as medical excusals for a quarterly average or who were in a combination of ENL and grade level classes, and as a result were also removed from the original number of participants. When these students were eliminated from the count, the final number in the initial calculations is 220 students (n=220). The percentage of low-SES participants based on the free/reduced lunch measure is now 31%, as six low-SES students were removed from the original population due to not meeting participation criteria.

The number of participants used in the data analysis varies based on the questions asked. Research questions one and two can be answered using data from the entire cohort of students and questions three through five need to be analyzed using only the belonging and self-efficacy scores that were a result of the student surveys, which needed consent/assent in order to be administered. As stated earlier, 55 consent/assent forms returned out of a sample of 230 students in this cohort. Five of the fifty forms were returned by students who had incomplete GPA data, rendering them ineligible to be included in the survey data. Eight of the 50 students who completed the survey qualified as low-SES, representing 16% of respondents and 11% of the low-SES population (74 students total) for sixth grade.

2.1.3 Author Note

The author of this dissertation currently serves as the Assistant Superintendent for Curriculum, Instruction, and Assessment for this school district. The author was the building principal when the needs assessment began.

2.2. Goals and Objectives

Students at Obama Middle School are typically measured primarily by academic performance; data on the affective factors of self-efficacy and belonging that may influence that performance, are not often measured. However, as discussed in the literature above, student learning has been shown to be related to both self-efficacy and one's sense of belonging, and so collecting this information may be of value. Yet, while there is concern at Obama Middle School for students and their affective states, a targeted assessment of these two constructs has not been completed prior to this needs assessment, and as a result, their impact on student learning has not been previously examined. While the changing SES demographics within this district have not been closely explored in terms of the relationship between student performance and SES there is ample literature surrounding poverty and its impact on outcomes for all age groups (see chapter 1). This study sought to examine the relationship between self-efficacy and academic performance and belonging and academic performance with attention to the role of SES.

2.2.1. Needs Assessment Questions

Q 2.1: Do low-SES students have lower mean Scholastic Math Inventory and Scholastic Reading Inventory assessments scores compared to their typical-income peers*?*

Q 2.2: Do low-SES students have a lower mean GPA than their typical-income peers?

Q 2.3: What is the association between self-efficacy and student GPA for the sample of students who took the survey?

Q 2.4: What is the association between belonging and student GPA for the sample of students who took the survey?

Q 2.5: Do low-SES students exhibit lower levels of self-efficacy and belonging than their middle or high-income peers?

2.3. Methodology

2.3.1. Measures

An extensive description of belonging and self-efficacy was provided in Chapter One. One aspect of how student learning is measured is through grade point average (GPA). Local assessments are included to provide an objective measurement of student learning through a math (SMI) and reading (SRI) inventory. An examination of whether these outcomes vary based on SES was conducted.

Two different instruments were utilized to gauge belonging and self-efficacy. The first, the Academic Belonging Scale (Cook et al., 2012) was adapted for middle-schoolers from Walton and Cohen's (2007) Academic Fit Scale. In personal correspondence with Dr. Walton (April 1, 2016), he suggested the use of the Academic Belonging Scale for middle school students as the instrument has been utilized for this age group in the literature. This scale measures the constructs of both social belonging and the potential to succeed in school by asking students to rate the degree to which they agree with a given statement as quantified on a scale of one (strongly disagree) to six (strongly agree). An example of one of these questions is, "I feel like I belong in my school" (Cook et al., 2012). This scale can be found in Appendix A, part I.

reliability and validity. Cook et al. (2012) aimed to demonstrate how a values affirmation could improve belonging and by extension, academic outcomes, for middle school students. Minority students, in this case African Americans, demonstrated the most academic gains from timely self-affirmations in which one has to write about core values. Although this

study was designed with African American students in mind, the potential exists for generalization of this to other stereotyped or marginalized groups, such as low-SES. Cronbach's alpha is reported at .76 at each assessment.

The aforementioned scale was shortened and modified from the Social and Academic Fit Scale (Walton & Cohen, 2007), which was originally designed for college students. Walton and Cohen (2007) used The Social and Academic Fit Scale to determine in two separate studies the degree to which motivation and achievement is impacted by a lack of a sense of belonging, especially for classically stereotyped groups. Results showed that by helping students to see that they belonged in computer science classes, academic achievement improved. This scale is relevant to this research because it is the founding measurement of belonging.

Part II of the survey in Appendix A is a modified version of the Children's Self-Efficacy Scale (Bandura, 2006). Bandura's scale contains 23 items and the version for the study found in Appendix A consists of 18 items. The 18 items are disaggregated based on the following: Self-Efficacy in Enlisting Social Resources (questions one through four), Self-Efficacy for Academic Achievement (questions five through 11), and Self-Efficacy for Self-Regulated Learning (questions 12 through 18). Items were eliminated based on relevance to the school environment. For example, confidence to "learn algebra" was taken off the list due to the fact that many students will not take the course until high school. One item, "learn to use computers" was modified to "learn to use technology effectively" given the increase in student technological expertise since the scale was published in 2006. For all of the indicators students are asked to share their confidence on the individual item on a scale of zero (cannot do at all) to 100 (highly certain can do). This scale was selected due to its wide use in the literature.

description. Self-efficacy is a multidimensional construct, and as a result, instruments that are domain-specific are needed in order to produce valid and reliable measures (Choi, Fuqua, & Griffin, 2001). Items were eliminated based on relevance to the school environment. For example, confidence to "learn algebra" was removed from the Self-Efficacy for Academic Achievement subscale due to the fact that many students will not take the course until high school. One item, "learn to use computers" was modified to "learn to use technology effectively" given the increase in student technological expertise since the scale was published in 2006. For each indicator the student was asked to share their confidence on a scale of zero (cannot do at all) to 100 (highly certain can do). Other examples of survey questions include, "Learn social studies" and "Get myself to study when there are other interesting things to do". Students were given as much time as needed to complete this self-reported measure.

validity and reliability. The Cronbach's alpha reliability test results were .70 for Self-Efficacy for Academic Achievement and .87 for self-efficacy for Self-Regulated Learning (Zimmerman et al., 1992). Miller, Coombs, and Fuqua's (1999) set out to examine the reliability and construct validity of the MSPSE with mostly white, middle class high school students who were taking an ACT prep course. They likewise found similar Cronbach's alpha scores for Self-Efficacy for Self-Regulated Learning (.87) and Self-Efficacy for Academic Achievement (.74). Evaluation of the subscale Self-Efficacy for Enlisting Social Resources scored much lower, registering a .60 alpha score due in part to the small number of items.

Part III of the survey asked two open-ended questions: "What do you consider the best part of your middle school experience so far?" and "Please describe the greatest challenge you have faced in middle school so far. List anything that we can do more of or differently to help you be successful." These were added in an effort to gain insight as to the perceived challenges

and successes that individual students experience in middle school. Since these are open-ended questions, the direction of the answers is unknown, but they may provide valuable insight when developing potential interventions. At a minimum, the answers will provide knowledge on the local level separate from this study.

The first variable in this research is SES, with low-SES defined as those students who qualify for free/reduced lunch under the federal poverty guidelines from the U.S. Department of Agriculture (2015). This information will be collected for individual students from our local student management system.

The second variable is grade level proficiencies for local assessments as defined by student scores on the Scholastic Math Inventory (SMI) and the Scholastic Reading Inventory (SRI). This information was accessed through the Scholastic Achievement Manager. The SRI measures reading comprehension in Lexiles and divides student performance into four categories: Below Basic (BR to 729), Basic (730 to 924), Proficient (925 to 1070), and Advanced (1071 to 1700+) (National Governors Association Center for Best Practices Council of Chief State School Officers, 2012). The mid-year proficiency range and the most recent SRI score was utilized. The SMI measures student performance in Quantiles, which measures mathematical skills in conjunction with the Common Core Standards. Three areas of designation used includes: Below Basic Quantile Range (EM to 700), Basic Quantile Range (705 to 865), Proficient (870 – 1125), and Advanced Quantile Range (1130 to 1200) (MetaMetrics, 2009). The most recent administration of the SMI was used. Both of these measures were captured through computer-adaptive assessments developed by Houghton Mifflin Harcourt (formerly Scholastic) and are both norm and criterion referenced (MetaMetrics, 2009).

GPA was also utilized to measure academic achievement for all sixth graders by the averaging of quarter one, two, and three final averages for the core classes of English, social studies, math, and science. GPA was analyzed in aggregate by quarter and course. This information is also available through the local student management system.

The constructs of belonging and self-efficacy were measured separately through one combined survey. Belonging was measured through the Academic Belonging Scale (Cook et al., 2012), with students having rated themselves on a six-point scale. Two of these items were reverse scored. The average score for each scale was recorded. Self-efficacy was measured and quantified based on the self-reported confidence level score of students (0 to 100) on 18 survey items. The scores from this scale were disaggregated and averaged for each section (Self-Efficacy in Enlisting Social Resources, Self-Efficacy for Academic Achievement, and Self-Efficacy for Self-Regulated Learning). Two open-ended questions were examined for qualitative use based on student responses.

2.4. Summary of the Results

Needs assessment question 2.1 asks, *Do low-SES students have lower mean Scholastic Math Inventory and Scholastic Reading Inventory assessments scores as compared to their typical income peers?* The availability of secondary data allowed for analysis of this inquiry, beginning with the SMI. The use of descriptive statistics shows that low-SES students had a lower mean score and a higher standard deviation than typical SES students. The lowest SMI score comes from at least one low-SES student, as well as the highest SMI score, which was unexpected.

Table 2.4.

Scholastic Math Inventory Scores for Low and Middle SES Students at Obama Middle School

	N	Min	Max	Mean	Std. Deviation
Math Inventory Scores for low-SES Students	67	150	1295	683.73	220.87
Math Inventory Scores for Middle SES Students	153	265	1260	785.39	180.99

The same process outlined above was used to analyze the SRI by SES, resulting in similar findings. Typical income students had a higher mean score, at least one typical SES student had the highest maximum score, and the minimum score for typical SES students was 72 points higher than the minimum score for low-SES students. Additionally, there is a lower standard deviation for typical SES students when compared to the standard deviation for low-SES students. Perhaps the most alarming statistic is the disparity in mean scores between typical and low-SES students. Students are expected to gain about 70 Lexiles in a school year. These results show that low-SES students lag behind their typical SES peers by just under two grade levels, according to this assessment.

Table 2.5.

Scholastic Reading Inventory Scores for Students at Obama Middle School

	N	Mean	Std. Deviation
Reading Inventory for Low-SES Students	67	857.84	236.98
Reading Inventory for Typical- SES students	153	987.40	206.186

In terms of needs assessment question 2.2, *do low-SES students have a lower mean GPA than their typical-income peers*, the trend that was evident throughout the local assessments

continue with core class (English, social studies, math, and science) GPA. In aggregate, students of a low-SES (86.08%) demonstrated quarterly averages below their typical SES peers (90.63%) and also possessed an overall greater average standard deviation. The disparities are consistent across the content areas, with students of a low-SES consistently demonstrating poorer GPA's across the board. These scores are displayed in more detail in Table 2.6.

Table 2.6

Core Class GPA for Low Versus Typical SES Students at Obama Middle School

SES	Course	N	Minimum	Maximum	Mean	Std. Deviation
Typical	English	153	65	100	91.85	5.73
	Math	153	55	100	88.7	8.08
	Science	153	58	100	91.49	6.97
	Social Studies	153	65	100	90.47	7.32
	Overall				**90.63**	**7.025**
Low	English	67	68.67	99.3	86.92	7.77
	Math	67	64.67	99.33	85.24	9.41
	Science	67	58	99.67	86.11	10.02
	Social Studies	67	58	99.67	86.02	8.76
	Overall				**86.08**	**8.99**

The small sample size of low-SES students limits the generalizability of the findings. Of the low-SES students that did participate, their average GPA score (88.6%) was actually higher than typical SES students involved in the study (88%), which can be explained through further

analysis. Of the eight students who qualified as low-SES out of the sample of 50 students, three students had significantly higher GPA's than the other five. In fact, the average GPA for the three highest performing low-SES students was 97.44%. Taking those high performing students out of the mix, the average GPA for the remaining students is 83.7%, which is well below the typical-SES average GPA. Those three students also had higher self-efficacy and belonging scores when compared to the other five low-SES students. This demonstrates that for this sample of students, there is a positive relationship between academic outcomes and scores of self-efficacy and belonging.

Needs assessment question 2.3 asked, *What is the association between self-efficacy and GPA for students who took this survey?* Tables 2.7 through 2.11 demonstrate the results of the Pearson Correlation in SPSS. The positive correlation between GPA and Self-Efficacy in Enlisting Social Resources was found significant at the .007 significance, the positive correlation for Self-Efficacy and Academic Achievement was also highly significant ($p<.001$). GPA and Self-Efficacy for Self-Regulated Learning were similarly positively correlated ($p<.001$) and overall self-efficacy and GPA found to be a .534 correlation and .000 significance level. These results show that students with higher GPAs are more likely to also hold higher self-efficacy beliefs (See Tables 2.7, 2.8, 2.9. and 2.10.)

Table 2.7.

Correlation Between GPA and Self-Efficacy for Enlisting Social Resources

		Avg GPA Q1-3	Avg SE in Enlisting Social Resource
Avg GPA 1-3	Pearson Correlation	1	.379**
	Sig. (2-tailed)		.007
	N	50	50
Avg SE in Enlisting Social Resources	Pearson Correlation	.379**	1
	Sig. (2-tailed)	.007	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Table 2.8.

Correlation Between GPA and Self-Efficacy for Academic Achievement

		Avg GPA Q1-3	Avg SE for Academic Achievement
Avg GPA 1-3	Pearson Correlation	1	.486**
	Sig. (2-tailed)		.000
	N	50	50
Avg SE for Academic Achievement	Pearson Correlation	.486**	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Table 2.9.

Correlation Between GPA and Self-Efficacy for Self-Regulated Learning

		Avg GPA Q1-3	Avg SE for Self-Regulated Learning
Avg GPA 1-3	Pearson Correlation	1	.478**
	Sig. (2-tailed)		.000
	N	50	50
Avg SE for Self-Regulated Learning	Pearson Correlation	.478	1
	Sig. (2-tailed)	.000**	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Table 2.10.

Correlation Between GPA and Overall Self-Efficacy

		Avg GPA Q1-3	Avg Overall SE
Avg GPA 1-3	Pearson Correlation	1	.534**
	Sig. (2-tailed)		.000
	N	50	50
Avg Overall SE	Pearson Correlation	.534**	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Needs assessment question 2.4 asks, *What is the association between belonging and GPA for the sample of students who took the survey*? Table 2.11 shows the relationship between GPA and belonging, with a reported .494 correlation and .000 significance level.

Table 2.11

Correlation Between GPA and Belonging

		Avg GPA Q1-3	Avg Belonging
Avg GPA 1-3	Pearson Correlation	1	.494**
	Sig. (2-tailed)		.000
	N	50	50
Avg Belonging	Pearson Correlation	.494**	1
	Sig. (2-tailed)	.000	
	N	50	50

** Correlation is significant at the 0.001 level (2-tailed).

Needs assessment question 2.5 states, "*What are average belonging and self-efficacy scores for low and typical SES students?"* Average mean belonging scores differed for low and typical-income students, with low-SES students reporting an average of 5.1 and typical-SES students 5.28 on a six-point Likert scale. However, because the sample is small generalizing to the larger school population is not warranted; further data collection and analysis with larger sample sizes should be conducted in the future.

In terms of self-efficacy, the average score for the sample was measured in aggregate and for the three subscores. The results were surprising compared to what is present in the literature. Students of a low-SES had on average higher scores than their typical-income peers for overall self-efficacy (88.9 vs. 88.3), Self-Efficacy for Enlisting Social Resources (79.4 vs. 77.8), Self-Efficacy for Academic Achievement (95.4 vs. 94.2), and Self-Efficacy for Self-Regulated Learning (87.7 vs. 87.4). As with the belonging results, the small sample size indicates that generalizing would be inappropriate and evaluation with further analyses was not done. The

negative disparities found to exist for low-SES students in aggregate in terms of academic outcomes, were not seen within the small sample of low-SES students for the intermediate variables of self-efficacy and belonging.

While the sample sizes for the intermediate variable data were insufficient for a detailed investigation, the academic score data showed that low-SES students demonstrate poorer learning outcomes on measures such as GPA and local assessments (SRI and SMI) compared to their typical SES peers and these findings establish that the needs of our low-SES students are not being met. Considering that the literature review has established both belonging and self-efficacy as relevant constructs, continued investigation of these factors and the role they may play in explaining the poor academic outcomes which has been found, is appropriate.

Chapter 3

The needs assessment findings shared in Chapter Two demonstrated that students with low SES had substantially lower GPA and math and reading assessment scores than their middle to high-income peers. The sample sizes for the belonging and self-efficacy measures were too small to establish whether there are significant differences between the two groups. Although a small sample of students were able to complete the belonging and self-efficacy survey (n=50) in the spring of 2016, the findings did show that students from a low-SES background who had a high sense of self-efficacy and belonging also had higher average GPA's than their low-SES peers who rated themselves low on the self-efficacy and belonging survey. While it is not possible to generalize findings from such a small sample, the fact that there was a positive relationship between academic outcomes and belonging and self-efficacy, even for low-SES

students, presents a promising opportunity. It is not possible or feasible to directly improve one's SES without massive resources, so instead, the targeting of the mediating variables of belonging and self-efficacy are worthwhile constructs to leverage given the literature that supports the relationship between belonging and academic outcomes and self-efficacy and academic outcomes.

3.1. Self-Efficacy Intervention Literature

Fostering of self-efficacy can effectively assist learners in the management of academic task demands (Zimmerman, 2000). Targeted self-efficacy interventions can improve pro-school behaviors. One example of this is the REAL Girls program aimed to assist at-risk middle school girls in developing resilience, which Mann et al. (2015) categorize as academic self-efficacy, school connectedness, and identity. The researchers utilized the Academic Self-Efficacy subscale of the Patterns of Adaptive Learning Scales (Midgley et al., 2000) to measure student confidence in meeting academic challenges. This quasi-experimental, mixed-methods study utilized a crossover design, citing that it would be unethical to not administer tenets of the program to both groups, as previous literature that supported the effectiveness of this program (Mann et al., 2015). The researchers found that each group demonstrated increases in each variable when assigned to the treatment condition and either stayed the same or slightly decreased when under the comparison condition. Arslan (2013) demonstrated that through targeted interventions, mastery experiences, vicarious experiences, and social persuasion can be leveraged to improve self-efficacy for low-SES students. Improving the self-efficacy of students of a medium SES can be most effectively done through mastery experience and social persuasion, and for high SES students, mastery experience and social persuasion. The

malleability of self-efficacy through these two studies opens a door of opportunity as a way to improve academic outcomes, particularly for low-SES students.

Studies that describe interventions that did not work in improving self-efficacy can also serve as useful when determining which intervention to apply within one's professional context. An example of this comes from Niehaus, Rudasill, and Adelson (2012) in their study examining academic self-efficacy, motivation, and participation in an after-school program in relationship to the academic achievement of Latino middle school males. While the researchers demonstrated that self-efficacy was a positive predictor of both school attendance and mathematical standardized achievement scores, self-efficacy did not increase as a result of students attending the after-school program. This is important because although there was a connection between self-efficacy and academic performance, this particular intervention did nothing to improve self-efficacy. Further, although this was not part of the study, it would have been interesting to see if the students' sense of belonging improved from being a part of this after-school club. While additional research on the malleability of self-efficacy exists, the majority of intervention literature in this chapter is focused on belonging.

3.2. Belonging Intervention Literature

Student perception of belonging academically is a positive predictor of motivation, engagement, and success (Cook et al., 2012; Connell, Halpern-Flesher, Clifford, Crichlow & Usinger, 1995). Ample research has demonstrated the effectiveness of targeted belonging interventions that result in improved academic outcomes for underserved groups. Walton and Cohen (2011) aimed to improve social belonging for typically stereotyped college freshmen (African Americans), recognizing that social belonging impacts intellectual achievement and IQ

scores. Although Walton and Cohen (2011) consider their intervention brief, by targeting social hardship as a temporary and fixable issue, the achievement gap between African American and White students was halved, while raising overall GPA over a three year time period. This intervention also found that by intentionally fostering and cementing social belonging, African American students had improved health outcomes over a three-year period, including self-reported health, less doctor visits, and overall well-being. While this intervention was targeted to African American students, there is potential for its findings to be generalized to any group with a low sense of social belonging.

A similar earlier belonging intervention showed improvements for African American students in achievement-promoting behaviors and GPA (Walton & Cohen, 2007). Additional related studies include a social-belonging intervention by Walton, Logel, Peach, Spencer, & Zanna (2015), which improved the GPA of women in engineering majors, a field traditionally dominated by men. An additional social-belonging intervention also improved retention for first-generation and African American college students (Yeager et al., 2016). Other belonging interventions appear in the literature as categorized below.

3.2.1. Improvement of self

One aspect of improving belonging is focusing on the improvement/affirmation of self. Cohen, Garcia, Apfel, and Master (2006) demonstrated that a brief values affirmation could improve belonging, and as a result academic achievement, for African-American students. African American (119) and European American (124) students in a middle to lower income middle school were assigned to two different groups (control group and treatment). The treatment group was asked to write about their most important value and why it was significant to them, while the control group was asked to write about their least important value and why it

was so. GPA improved for African American students in the control group not only in the targeted intervention course (social studies), but also across all measured subject areas. There was no negative impact for the control group or for the non-minority students in the treatment group. In a related study conducted prior to Cohen et al. (2006), Good, Aronson, and Inzlicht (2003) created a mentoring program for transitioning middle school-age students that targeted numerous minority groups, such as low-SES students, African American, Hispanic students, and females in math and science courses. College mentors met face to face and communicated online with middle schoolers reinforcing one of three messages: intelligence is malleable, many students in seventh grade struggle but eventually improve, or a combination of the two messages. The middle school students were then asked to create a webpage that illustrated the message conveyed by their mentor in their own words. The control group completed similar web-based activities around the topic of drug and alcohol prevention. All students were told that their products would be used as 'public service style' messages for others. An increase in performance on the high-stakes state math assessment occurred for females who had been part of the malleable intelligence group, and the previous gender gap that existed on the math assessment was erased for the other two other intervention-related messages, with both genders improving. Scores improved on the state reading assessment for low-SES, African American, and Hispanic students who received any of the three intervention-related messages. For the students who were part of the anti-drug group, achievement did not change.

3.2.2. Belonging and the community

A second aspect of improving belonging is strengthening the connection between a student and the school community. Bowen, Wegmann, and Webber (2013) built on previous values affirmation studies and combined it with an enhancement of the physical environment,

namely the teacher reading a student-written essay. Students in grades six, seven, and eight were assigned to write either a neutral essay or a values affirmation essay. Then, two subsets of the affirmation essay and neutral essay students were assigned to the reading condition, in which their homeroom teacher read what students had written. Social studies GPA results showed that students who wrote a values essay experienced less of a decline in GPA throughout the school year. For students who wrote the affirmation essay and had a teacher read it, their starting quarterly grade was 3.7 points higher than those students who wrote affirmation essays without adult involvement. Students who wrote the neutral essay experienced the typical decline in GPA (as demonstrated in this school over time based on the analysis of the researchers prior to the commencement of the study) throughout the school year regardless of teacher participation.

Another affirmation study focused on the level of threat within a given school context across 16 middle schools in Wisconsin (Hanselman, Bruch, Gamoran, & Borman, 2014). To measure the level of threat within a particular school, researchers examined the number of marginalized students that fell within racialized achievement patterns. The methods for this study followed well-known interventions within the literature (Cohen et al., 2006, Cook et al., 2012, Sherman et al., 2013). They found that gains from the affirmation was greater in more threatening environments, and gains were non-existent in low threat environment. Students of a low-SES were not the primary focus of this study, although the percentage of students on free/reduced lunch was mentioned as more of a covariate factor.

The association between engagement, belonging to school, helplessness and social relationships was examined by Raufelder, Sahabandu, Martinez, and Escobar (2015). The authors sampled 1088 students in seventh and eighth grade ages 12-16 in Germany, with the mean age being 13.70. Students self-reported on measures of student-to-student relationships,

teacher to student relationships, school belonging, helplessness in school, and school engagement. The researchers found that by strengthening social relationships, particularly between teachers and students, engagement, school related self-concept, and belonging improved, while feelings of helplessness in school declined.

3.2.3. Group relationships

A final category of improving belonging is fostering relationships with others at the group level. Groups that have been traditionally stigmatized in institutional settings, such as African Americans in school, may need additional support in order to have an adequate sense of belonging. Walton and Cohen (2011) designed and implemented a brief belonging intervention for African American students in their first year of college. Students in the belonging-treatment condition were provided survey results of feelings of belonging from current college seniors that demonstrated that the transition to college was difficult but temporary, and that it was difficult initially to find a group to belong to. Once hearing the results, students were asked to write an essay, which was later turned into a speech that was recorded with the purpose of sharing it with future college freshmen. Students in the control condition followed the same process but had an entirely different topic. The GPA of both African American and European American students in the treatment group improved. For students in the control group, African American students showed no improvement in GPA throughout their college career while European American students did see an increase. Daily surveys in the week following the intervention demonstrated that the intervention assisted African American students in dealing with challenges and adjustments to college life as a minority. African Americans from the treatment group also showed long term health benefits on self-reported measures. A scale up of this writing intervention occurred several years later with first-year Latino college students (Brady et al.,

2016). In a lab setting, a values affirmation was conducted with students in the treatment group who were asked to write about their most important value, with the treatment group writing about their ninth-ranked value. Part II of the intervention occurred two years later, finding stronger academic outcomes in the form of GPA for affirmed students, accompanied by higher scores of self-esteem, self-integrity, hope, and belonging.

3.2.4. Students of a low-SES and belonging

Belonging impacts students of a low-SES perhaps to a greater degree than typical SES students. Students of a low-SES report more of a decrease in school connectedness that resulted in poorer academic results (Niehaus, Rudasill, & Rakes, 2012). There is limited research that describes interventions targeted at improving belonging for low-SES middle school students. With that said, one values affirmation study was aimed at closing the science achievement gaps for first-generation (FG) college students. In a double-blind, randomized control trial, both FG and continuing-generation (CG) college students in the treatment condition wrote about two or three values that were most important to them. This brief intervention closed the achievement gap by 50% and retained more students in a traditionally-gateway course for future science courses (Harackiewicz et al., 2013). Another values affirmation intervention aimed to improve belonging for Latino middle school students. While this was not the main purpose of the study, it is important to note that 50% of the population of students in this study qualified for free/reduced lunch (Sherman et al., 2013). Again, this represents a somewhat familiar trend in the literature that low-SES students is not often the group primarily targeted for intervention, but instead is a secondary or covariate factor.

3.3. Intersection of Self-Efficacy and Belonging

Self-efficacy in Enlisting Social Resources, such as asking peers or adults for help, was identified in the needs assessment as an area of relative weaknesses for sixth grade students at Obama Middle School (see chapter two). This type of self-efficacy shares a natural overlap with belonging. Since self-efficacy impacts both cognitive and affective processes and belonging has been shown to positively influence academic achievement, the intersection of these two constructs potentially hold important meaning for student learning.

3.3.1. Emotionally safe classrooms

A theme in the literature regarding the intertwining of self-efficacy and belonging pertains to classrooms as emotionally safe learning spaces. One such approach, the Responsive Classroom (RC), emphasizes the equal importance of both affective and content area curricula, the critical nature of social interaction, and knowledge of one's students as essential components. In a randomized control trial, RC practices allowed for students to separate their math and science related anxiety from their efficacy, resulting in improved performance on academic tasks (Griggs et al., 2013). This randomized control trial consisted of 20 elementary schools over a three year period, with 12 of the 20 designated as (RC) schools. The Self-Efficacy and Anxiety Questionnaire adapted for math and science was used, consisting of 10 items for self-efficacy from the subscale of the Patterns of Adaptive Learning Scales (Midgley et al., 2000) and 10 items measuring subject-specific anxiety. The authors established a negative association between anxiety and self-efficacy of students in middle school math and science classrooms. This relationship was mediated in classrooms in which RC's practices were utilized more frequently as compared to classrooms in which those practices were used on a more infrequent

basis. The researchers attribute this to the stress on student effort and the emotional support provided within the learning environment, which can serve to counteract any negative self-interpretation of ability.

3.3.2. Student skills and decision making

Another approach that combined the concepts of belonging and self-efficacy was the implementation of the Student Success Skills (SSS) program by school counselors (Lemberger, Selig, Bowers, and Rogers, 2015). The goal was to refine students' cognitive and social skills training in an effort to improve academic outcomes. The model consists of a classroom instructional component, supported by booster lessons and follow-up small group counseling, if necessary. The researchers were able to demonstrate an increase in belonging (connectedness), executive functioning, and reading and math achievement scores.

3.3.3. Resiliency

Yet another approach was targeted towards improving resiliency in at-risk middle school girls through the REAL Girls program (Mann et al., 2015). The authors categorize resilience as academic self-efficacy, school connectedness, and identity. This quasi-experimental, mixed-methods study utilized a crossover design, citing that it would be unethical to not administer tenets of the program to both groups as previous literature supported its effectiveness. The intervention consisted of 12 strategies for promoting resilience over two school days, with a booster session 10 days later. The researchers found that both groups demonstrated increases in all three variables when assigned to the treatment condition and either stayed the same or slightly decreased with the comparison condition.

3.3.4. Improving students' understanding of their context

More recent research has advocated for a social psychology perspective on improving academic performance through the strengthening of student beliefs and their role within the context or environment. Affirmations and self-stories are two techniques or interventions that have been shown to result in long-term academic gains (Wilson & Buttrick, 2016). In examining achievement gaps, researchers have shown that interventions with role models and self-affirmations have mitigated threats to one's identity and improve academic outcomes (Spitzer & Aronson, 2015). Examining achievement gaps between races or ethnicities through the lens of belonging can result in the crafting of effective interventions. It is this researcher's hope that this can be adapted and generalized to students of a low-SES.

The interrelationship between self-efficacy and belonging (school community) can also be viewed as unidirectional, with belonging influencing self-efficacy (Vieno, Santinello, Pastore, & Perkins, 2007). The authors tested their theoretical model through structural equation modeling and other statistical tests, with results showing that school belonging significantly related to self-efficacy. Activities to encourage and foster a sense of community, such as group work or community service projects, are suggested by the researchers.

3.4. Transitions

The transition to middle school can be taxing on a learner's sense of belonging, as acceptance takes on added importance during adolescence (Goodenow, 1993), around the time when students are entering middle school. Vaz et al. (2015) examined longitudinal data to assess how 256 students from 52 primary schools navigated the transition to 152 secondary schools. The authors contend that students reconstruct their sense of belongingness after making the transition to secondary school, and therefore it is critical that both primary and secondary schools

make concerted efforts to foster belongingness through addressing 13 actionable components. During the transition to middle school and other sensitive transitions throughout a student's schooling, threats to belonging "may initiate a self-reinforcing downward spiral. As feelings of belonging in the environment decline, perceptions of threat mount, which undermine grades and further reduce feelings of belonging" (Cook et al., 2012, p. 480). The authors hypothesized that if a values affirmation intervention could begin before the threats unfolded, it could counter any mounting negative effects of a lack of perceived belonging for middle school students. This hypothesis was proven true, in addition to the treatment group demonstrating less fluctuation in belonging over a two-year period. Although this study was designed with African American students in mind, there is potential for the results to be generalized to other stereotyped groups, such as students of a low-SES.

A consideration additional to belonging is self-efficacy. To begin, given the changing of classes and the differing structure of the middle school as opposed to the elementary school, students may be exposed to peers that are new to them. Also, given that teachers are responsible for more students in middle school as opposed to elementary school teachers, students experience less individualized attention (Schunk & Pajares, 2002). As a result of these and other factors, learners' self-efficacy often declines in middle school (Harter, 1996).

The transition to high school is another important consideration. Throughout a learner's educational career, Gillen-O'Neel and Fuligni (2013) observed that school belongingness tends to decline as students get older, and usually the highest levels of belongingness are in the earlier grades. Belongingness decreases during the first year of transition to high school, and gradually increases throughout the remaining time. Lofgran, Smith, and Whiting (2015) studied science self-efficacy across the transition years of elementary to middle and middle to high school.

Using Bandura's Children's Self-Efficacy Scale modified for science-specific data, they found through multiple ordinary least squares regression that the most powerful result was a striking decrease in science efficacy in ninth grade, and lower science efficacy for females and Hispanic students as opposed to Caucasian males.

3.5. Measurements in the Literature

Belonging and self-efficacy are separate constructs that have been positively associated with academic achievement (see previous sections). The interrelated role that these two factors play in student learning is largely undefined in the literature. As a result, it is critical that the way in which each are measured enables the researcher to make a valid inference about what type of impact is had by each on the problem (Stein, 2017).

Self-efficacy, which has a broader research base as compared to belonging, has numerous scales that have been adapted for various age groups as well as task-specific measures of efficacy. Bandura created multiple self-efficacy scales as a way to quantify this construct. One such scale is the Children's Self-Efficacy Scale (Bandura, 2006). Bandura's scale contains 23 items rated on a scale of zero (cannot do at all) to 100 (highly certain can do). For the purposes of this research, the scales examined pertains to middle school age students and tasks of academic self-efficacy, which are tied to academic outcomes.

Belonging differs in how it is measured, similar to the variances in terms that exist as previously illustrated. Goodenow (1993) developed the PSSM scale, which supports the theory set forth by Wehlege et al. (1989) in terms of the psychometric measures (Hagborg, 1994). The survey has English and Spanish versions and has a reliability rating range from .77 to .88.

In expanding the use of the PSSM to the high school level, Hagborg (1994) did so by first completing a factor analysis of the items contained in the measure. The researcher also adjusted the measure to investigate the relationship between school membership, self-concept, and school climate. You, Ritchey, Furling, Shochet, and Boman (2011) conducted an exploratory and confirmatory factor analyses on the PSSM, finding three factors within the measure: Caring Relations, Acceptance, and Rejection.

The Social and Academic Fit Scale was designed by Walton and Cohen (2007) to measure students' sense that they belong in school, characterized as how well they fit within the greater school environment. Accordingly, the scale asks students to assess their potential for success and how likely it is that other people will accept them (Cook et al., 2012). Walton and Cohen (2007) used The Social and Academic Fit Scale to determine in two separate studies the degree to which motivation and achievement is impacted by a lack of a sense of belonging, especially for classically stereotyped groups. The reliability measure for each assessment was ⟨s ≥ .76, with Cook et al. (2012) attributing the reliability score to Walton and Cohen's (2007) original design of the scale as measuring two parts of a single construct. Cook et al. (2012) modified this instrument for its use with adolescents, with some examples being "People in my school accept me" and "I feel comfortable in classes in my school." The School Connectedness Scale (McNeely, Nonnemaker, & Blum, 2002) uses five items to measure the degree to which students feel cared for within the school environment. Two sample items are "I feel close to people at this school" and "I am a part of this school" (Mann, Smith, & Kristjansson, 2015).

3.5.1. Contextual Foundation

School social relationships also have shown to have a significant influence on educational outcomes, especially given that adolescence represents a stage of development in which students

are developing an identity separate from their parents and family members (Goodenow, 1993). Further, early adolescence is a period in which a student's sense of himself or herself is largely impressionable. This changing view of one's self within the broader context of a middle school setting reiterates the need for an emphasis on belonging in school and strong relationships with peers and adults.

In addition to the developmental stage of this age group, the context of Obama Middle School and how being from a low-SES background could impact belonging within in, deserves further explanation. While no specific analysis on what the exact factors could be exists, the researcher does have some assumptions based on the existing activities and requirements within the school. The first assumption pertains to the end of the year trip for eighth graders to Washington, D.C. While the school does all that it can to keep the costs down and students are notified well ahead of time, the trip costs approximately $500. This amount of money, even with a year's notice, could prove to be insurmountable for poor families. A more academic message could be sent through the requirement of graphing calculators in our advanced math courses. The school does have several calculators for students to use, however, the placing of this item on the supply list in the summer before school begins could inadvertently send a message of non-belonging to low-SES students. Finally, an athletic component that could translate to a social one is playing on athletic teams. Obama Middle School has several school teams across three seasons, which are open to all students. The expansion of year-round travel teams for various sports is evident in the building. This is outside of the school's control, however, students who participate on these costly travel teams and wear apparel advertising their team could also further the divide and serve as reminder that money, not skill, could be the reason for students of a low-SES not being able to participate.

Chapter 4

Chapter three highlighted the relevant existing intervention literature on belonging and self-efficacy and their relationship to academic outcomes. Considering this research base and the achievement gap identified in Chapter 2, a psychosocial belonging intervention modeled upon Walton and Cohen's work (2007, 2011) was designed and tested in comparison to a control condition. The study was conducted with the 2018-19 eighth grade cohort at Obama Middle School. Following pre-test activities, middle school students read testimonials of academic struggle and perseverance of high school students (treatment) or testimonials related to effective study skills (control). To support the eighth graders to internalize the message relative to their own experiences, each then created their own written narrative. The students were told that with their permission, select narratives will be shown to incoming sixth grade students the next summer during sixth grade orientation.

It is hypothesized by this researcher that through vicarious experiences, verbal persuasion, and physiological and emotional components, self-efficacy as a mediating variable will also improve through this intervention. It is further theorized than an improvement in self-efficacy will influence the cognitive and emotional processes associated with learning. A model adapted from Yeager et al. (2016) for middle school students is shown in Figure 4.1. It demonstrates the recursive process that can take place when students from an underrepresented group experience difficulties. This intervention is aimed at helping students see that challenges are temporary and a normal part of the middle school experience, and not a result of their membership in a disaffected group. It is further hypothesized that a belonging intervention may

indirectly improve self-efficacy because if a student feels as though they belong in an academic setting, a psychosocial barrier is removed. Both belonging and self-efficacy operate as perceptual filters when presented with a given task in a specific context. As belonging improves and students engage rather than withdraw from the social and academic environments this may afford opportunities for positive academic results leading to improved self-efficacy.

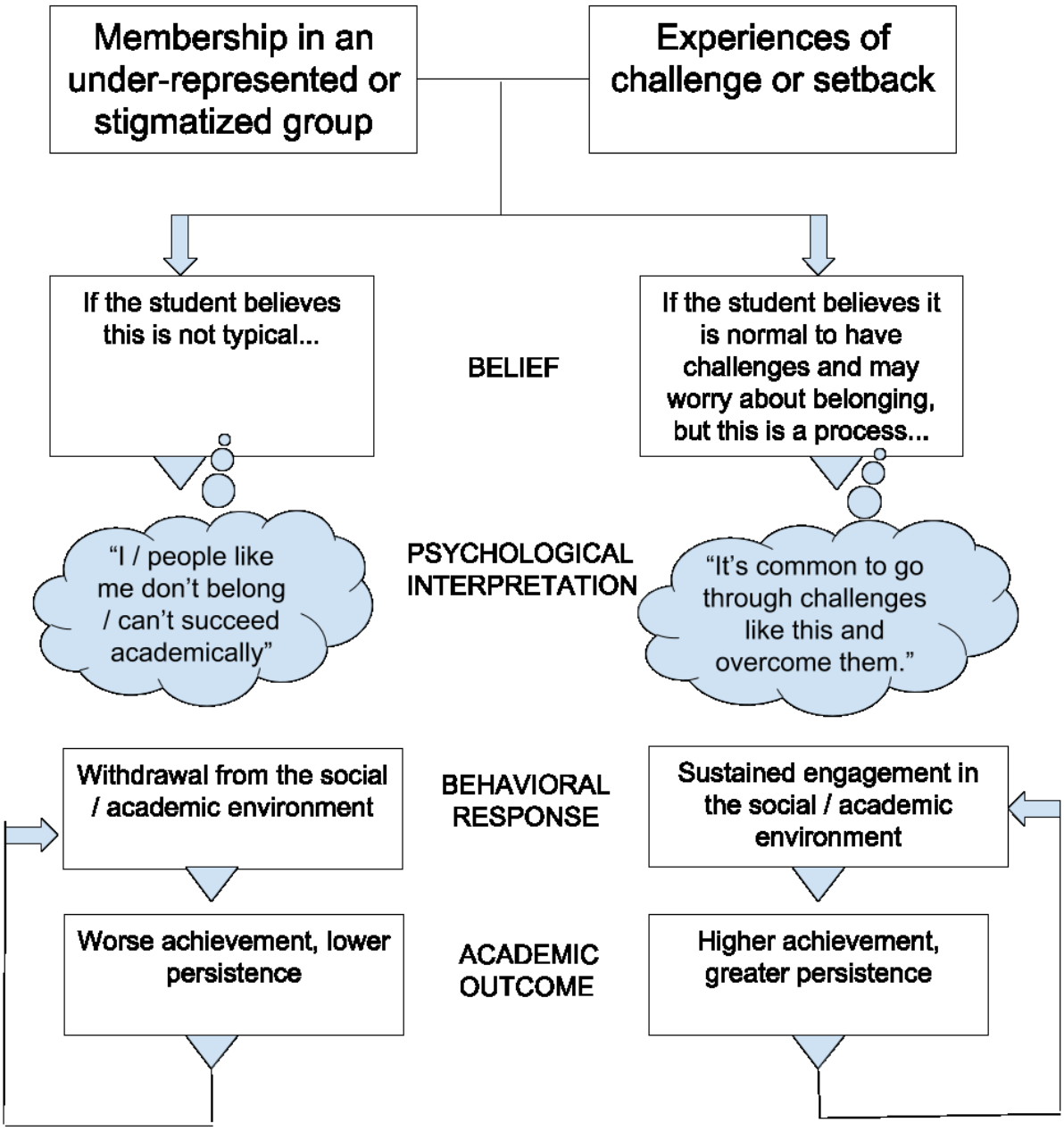

Figure 4.1.

Process Model Adapted From Yeager et al. (2016) for Middle School Students

4.1. Description of Selected Intervention

The intervention design was informed by a recently developed Beta Belonging Guide by Walton, Murphy, Logel, Yeager, and The College Transition Collaborative (2017). The guide identifies three key principles for successful belonging interventions, which were implemented and adhered to. First, the activity must be crafted so that the student engaging in the intervention must feel as though they are sharing their experiences with others for the benefit of the younger students. This situates those who are receiving the interventions as helpers, a more powerful position when compared being helped, which is what typically marginalized students often experience and can serve to diminish one's sense of belonging. Second, the content of the exercise is critical, and must include two components about struggle being a typical part of the educational experience: 1) worry about belonging in a new school, or in the case of this intervention, the challenging eighth grade academic year, is normal and 2) challenges that are faced can be overcome through time, effort, and the cultivation of relationships with others. Finally, a 'Saying-is-Believing' component must be embedded, meaning that students must apply and internalize the message from the older students to their own experiences, asking them to articulate how the themes in component two resonate with them.

All participating students were broken into two groups: control and treatment (see Methods section in this chapter). All students followed the steps outlined below, with the only difference being the content that students engaged in: those in the treatment group focused on stories of academic struggle and perseverance and those in the control group read and wrote about study skills.

Part one: all middle school students took a pre-test that measures belonging and self-efficacy.

Part two: middle school students read written testimonials from high school students that discussed individualized stories of academic struggle and ultimate perseverance (treatment) or study skills (control).

Part three: students reflected on stories of academic struggle and perseverance or study skills in their own lives and wrote a personal narrative.

Part four: all students took a post-test that mirrored the pre-test. The timing of the first post-test was one month after the pre-test.

It is important to note that no interviews with high school students were conducted for this intervention, as the narratives were instead crafted through the experiences shared with the researcher over time in this context. Students were told that a select number of narratives will be shared with the incoming sixth grade students at orientation the following summer. Table 4.2 outlines the logic model for this intervention.

Table 4.2.

Logic Model: Improving Academic Outcomes for Low- SES students at WMS via Self-Efficacy and Belonging

Note: Group 1 is the treatment group. Group 2 (control group) will follow the same procedure as the treatment group but will read and write about study skills, as suggested by Walton et al. (2017)

Inputs	Outputs		Outcomes		Impact
	Activities	Participation	Short	Medium	Long
Equipment Chromebooks	Older student **written narratives**	Based on conversations that the	**Self-efficacy and**	**Academic Outcomes** Improved	**Long term and long lasting**

Partnerships w. Teachers **Time** (Instructional class time) **Relationships with parents** to provide assent/ consent **Relationships with colleagues** MS principal, superintendent, eighth grade English teachers **Facilities** This will need to take place inside the classroom	⇨	that speak to academic struggle, perseverance **Pre-test** for Obama Middle School students measuring Belonging & SE (20 minutes) **WMS students read written narratives** of older students (20 minutes) **Students reflect in written form** about their own experiences of academic struggle (one class period) **Post- test** measuring SE & Belonging (20 minutes)	researcher has had with students over the years All 8th grade students with consent/ assent forms Groups 1 & 2 (Groups are comprised of all 8th grade students with consent/ assent forms) Groups 1 (academic struggle and perseverance) & 2 (study skills) All 8th grade students with consent/ assent forms	⇨	**Belonging Measures** Analysis of pre/post survey results	GPA at the end of 8th grade **Self-efficacy and Belonging Measures** Analysis of pre/post survey results	**academic outcomes** GPA: Is there an improvement in GPA beyond 8th grade? **Self-efficacy and Belonging Measures** Analysis of pre/post survey results

Assumptions	**External Factors**
- Self-efficacy and belonging improve academic outcomes such as GPA - An increase in self-efficacy through physiological/ emotional, vicarious, and verbal persuasions will improve self-efficacy, which will improve the	- Any changes in context could change students sense of their self-efficacy and/or belonging - Other external factors could influence GPA

cognitive and affective processes associated with self-efficacy - Students will take the activities seriously

4.1.2 Crafting of the Intervention Narratives

The researcher crafted both the control and treatment narratives using the Beta Belonging Guide by Walton et al. (2017) and the professional experience of having spent many years in this context. Two main messages to convey within the treatment narratives are first, that struggle is normal and temporary and second that it can be overcome. Through the narratives it is important to show that the student underwent a process in which one's sense of belonging increased over time. When the researcher was crafting there was intentionality in showing that each student experienced a difficulty that was overcome with time and persistence. In terms of representation, the researcher made certain that males and females were equitably represented and that traditional names from various ethnic groups were used (Amy, Julio). Steps were also taken to make sure that the context of Obama Middle School was evident, referencing such class periods as SSR and high school level classes. The control narratives had a similar approach in terms of male/female and ethnic representation. The content of the control group narratives focused on advice to improve study skills and overall academic performance. All narratives spoke to struggle and perseverance.

4.2. Evaluation Design

4.2.1 Research Questions for Selected Intervention

Is participation in the proposed belonging intervention related to student outcomes in the following areas:

RQ 4.1 Belonging

RQ 4.2 Self-efficacy

RQ 4.3 Academic performance

RQ 4.4 Is the impact of the intervention moderated by SES status?

4.3. Methods

The pre-survey was administered on January 4th, 2019 in English classes to all students in eighth grade and 212 students responded. If a student was absent on this date they were asked to complete the survey in class when they returned. The teachers reported that it took 10 minutes or less for all of the students to complete the survey. The survey consisted of a modified version of Bandura's Children's Self-Efficacy Scale Modified (2006) and the Academic Belonging Scale (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012). See Appendix A for a replica of this survey. Students completed this via a Google Form and results were electronically delivered to the researcher.

All students in the eighth grade completed the pre-survey. A total of 74 students returned the consent/assent forms. Data for the 74 students was inputted into an Excel spreadsheet, which was then loaded into SPSS with the following information included: student identification numbers, SES status (low or not), ethnicity (White, Hispanic or Multi-Racial), sixth and seventh grade GPA classified by quartiles, and belonging and self-efficacy pre-survey data. The 'Random' function was utilized to determine treatment and control groups. Once the groups were determined, the researcher examined the two groups ensure that there was representation of low-SES students in each group, even though there was a poor overall response for low-SES students (of the 74 students that provided consent/assent, 7 students or 9.4%, were classified as low-SES, compared to an overall percentage of 29% in the eighth grade). Once the treatment

and control groups were determined, students were assigned either the belonging (treatment) or study skills (control) narratives and writing assignment by the researcher via Google Classroom. Students who did not provide consent/assent were randomly assigned by the researcher to either the belonging or study skills narratives and writing.

Following this process, all eighth grade students were asked to participate in either the belonging or study skills activity. This consisted of reading five narratives from older students and then writing about their own experiences for the benefit of next year's sixth grade students. The narratives for both the treatment and control groups, as well as the directions for the writing assignment, are found in Appendix E. Once the students completed their assignment, they submitted it via Google Classroom. Their work is accessible by the researcher and any of the three eighth grade English teachers.

The post-survey was administered to students approximately one month later. A survey almost identical to the pre-survey was administered, with several exceptions pertaining to fidelity of implementation. These changes include: '*Several weeks ago you were asked to read five narratives from older high school students. How many of those did you read?' (*options were '*four or five' or 'three or less'), 'To what degree did the reading and writing activities engage you?"* (scale of one to three), *'How difficult/easy it was for you to think of an example of academic struggle and perseverance?' (*also a scale of one to three), and finally, *'Do you have any recommendations for us if we were to ask other students to complete these activities?' (a write-in option).* This survey can be found in Appendix F. Three of the 74 students who returned consent/assent forms did not complete the post-survey, leaving 71 participants from which data could be extracted and reported.

4.3.1. Participants

The participants in this study were eighth grade students at Obama Middle School during the 2018-19 school year. There are 235 students in this cohort. Students that have arrived to this country within the last year who are in our English as a New Language program and students who have significant developmental delays and do not participate in the New York State Mathematics and English Language Arts assessments were not asked to participate. Further, since 6th and 7th grade GPA data was used, students who were not enrolled at Obama Middle School were removed from the sample, leaving 207 eligible students. Of the 207 eligible students, 74 returned consent/assent forms and were able to complete the pre and post survey data.

4.3.2 Comparison of Treatment vs. Control on Demographics and GPA Quartile Status

Students were separated into the treatment (n=36) and control (n=35) groups (see Evaluation Design later in this chapter for additional details as to how these groups were determined). Demographic similarities and differences between members of the treatment and control groups are presented in Table 4.3.

Table 4.3.

Frequencies of Treatment and Control Groups by Demographics and GPA Quartile Status

	Control Freq/%	**Treatment Freq/%**
Race/Ethnicity		
White	24 (66.7%)	29 (82.9%)
Hispanic	12 (33.7%)	4 (11.4%)
Multi-Racial	0	2 (5.7%)

Gender		
Female	15 (41.7%)	13 (37.1%)
Male	21 (58.3%)	22 (62.9%)
Special Education Status		
Disability Y	2 (5.6%)	6 (17.1%)
Disability N	34 (94.4%)	29 (82.9%)
Low-SES Status		
FRL eligible	2 (5.6%)	5 (14.3%)
FRL ineligible	34 (94.4%)	30 (85.7%)
6th Grade GPA		
1st quartile	3 (8.3%)	4 (11.4%)
2nd quartile	11 (306%)	9 (25.7%)
3rd quartile	13 (36.1%)	7 (20%)
4th quartile	9 (25%)	15 (42.9%)
7th Grade GPA		
1st quartile	2 (5.6%)	5 (14.3%)
2nd quartile	8 (22.2)	6 (17.1%)
3rd quartile	12 (33.3%)	8 (22.9%)
4th quartile	14 (38.9%)	16 (45.7%)

White students comprise a majority of both the treatment and control groups, which fits with the overall demographics of the school. However, 83% of the treatment group is comprised of White students and 67% of the control group is represented by White students. The treatment group has four Hispanic students representing 11% of the group, and the control group has 12

Hispanic students (33%). The control group proportion of Hispanic students is more representative of the larger population which the treatment group is less so.Two Multi-Racial students are in the treatment group and no students of this designation fall within the control group.

Table 4.3 also illustrates the composition of the treatment and control groups across several demographic factors. Males are overrepresented in both the treatment group at (63%) and control groups (58%) when compared with the building-wide population.. The overall low response rate for low-SES students compared to the school-wide population has already been noted, represented by just seven of the 71 respondents.

Additional analysis was conducted to test for statistical differences in the demographics and GPA quartile status of the treatment and control group. These results are displayed in Table 4.4. The Chi-Square Test of Independence performed showed that the relation between ethnicity and assignment to treatment and control group was significant, *X2 (2, N=71=7.17, p<.05)* which shows that ethnicity varies more than by chance between the two groups. No other significant relationships for demographics or categorical GPA status (1^{st}-4^{th} quartile) were found.

Table 4.4
Pearson Chi-Square for Control/Treatment Groups (N=71)

Variable	**Chi-Square Value**	**df**	**Asymptotic Significance (2-sided)**
Gender	.260	1	.610
Ethnicity	7.170	2	.028*
Special Education Status	2.493	1	.114
504 Status	1.070	1	.301
ENL Status	1.070	1	.301

Low SES Status	1.606	1	.205
6th Grade GPA	3.466	3	.325
7th Grade GPA	1.593	3	.661

*p<.05

4.3.3 Comparison of Treatment vs. Control on Self-Efficacy and Belonging Measures

Results from descriptive examination of the pre-test scores for belonging and the three sub-components of self-efficacy are provided in Table 4.5. Table 4.6 reports the results of an independent samples t-test to compare these pre-test scores for the treatment and control groups. There was a significant differences between the control and treatment groups for the three self-efficacy sub-components: SE for Social Resources t(72)=2.93, p=.005; SE for Academic Achievement t(72)=3.4, p=.001; SE for Self-Regulated Learning (t(72)=2.64, p=.01. Because of these results showing that the control group scored statistically higher than the treatment group at pre-test ANCOVA tests controlling for these differences were carried out for the pre-post differences (see chapter 5).

Table 4.5.

Examination of Mean Pre-Test Differences in the Treatment and Control Groups

	Control Pre-test	**Treatment Pre-test**
	Mean (SD)	**Mean (SD)**
Pre-test: Avg Belonging	4.23 (.48) n=36	4.11 (.31) n=35
Pre-test: Avg SE for Social Resources	81.01 (13.92) n=36	71.92 (13.8) n=35
Pre-test: Avg SE for Acad Achieve	90.87 (10.48) n=36	82.95 (10.15) n=35

Pre-test: Avg SE for Self-Regulated Learning	81.68 (14.82) n=36	72.67 (15.27) n=35

Additional analyses were run to see the extent to which the treatment and control groups varied.

Table 4.6 outlines this in more detail.

Table 4.6

Independent Samples T-Test of Pre-Test Measures

		T-test for equality of means					**95% Confidence Interval of the difference**	
		t	**df**	**Sig (2-tailed)**	**Mean diff.**	**Std. Error Difference**	**Lower**	**Upper**
Belonging Pre	Equal variances assumed	1.907	69	.061	.292	.153	-.013	.599
Self-Efficacy For Social Resources	Equal variances assumed	2.929	72	.005**	9.471	3.233	3.026	15.92
Self-Efficacy for Academic Achievement	Equal variances assumed	3.401	72	.001**	8.038	2.364	3.326	12.75
Self-Efficacy for Self-Regulated Learning	Equal variances assumed	2.636	72	.010*	9.023	3.423	2.199	15.85

*p<.01
**p<.005

4.3.4 Data Collection Timeline

The GPA for all students for middle school years (sixth and seventh grade) was collected prior to the beginning of their eighth grade year. Belonging and self-efficacy survey data was collected at least one week prior to the implementation of the treatment, as well as one month after. Meetings with key constituents, such as the three eighth grade English teachers who were implementing the intervention, the guidance counselor who was introducing it, and the middle school administrators, took place prior to the intervention. All data was collected electronically. Figure 4.7 outlines the timetable for this intervention in further detail.

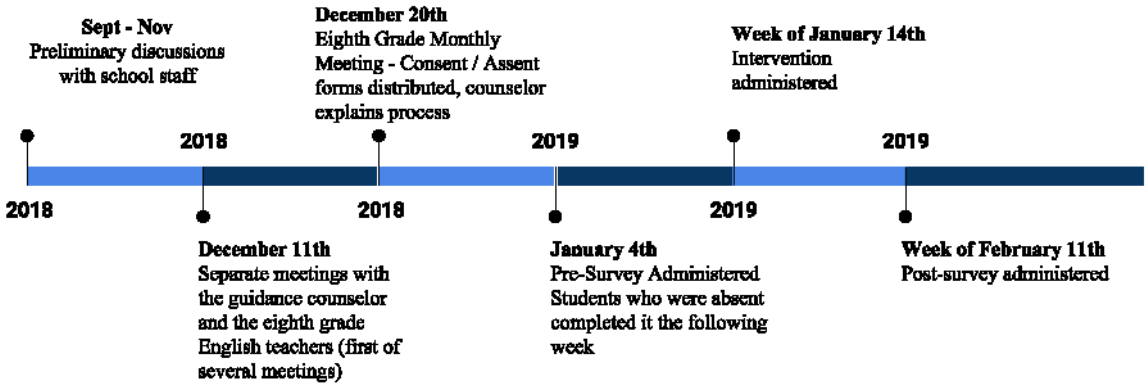

Figure 4.7.

Timeline of Intervention and Planning Activities

4.3.5 Analytic Approach

The relationships among self-efficacy, belonging, and GPA were examined to determine if a relationship exists. Analysis of differences between low and typical SES students were

planned. However, due to the low return rate for consent/assent, particularly for students from a low-SES background, these analyses were not conducted.

Descriptive statistics of GPA are presented for all participants. Students who participated in the intervention had their quarterly averages examined in previous grades (sixth, seventh and quarter one of eight). This GPA data was similarly examined for students in the control group for comparative purposes. Students of a low-SES within each group were compared with their typical income peers.

4.4. Outcome Evaluation

4.4.1. Measures / Instrumentation - Description of Variables

4.4.1.1. Socioeconomic status

SES was an independent variable in this study, with students either classified as low-SES or typical SES; a student from a low-SES background is defined as being eligible for participation in the free/reduced lunch program. Sirin (2005) identified this single measure as less than ideal given that eligibility for the free/reduced lunch program is vulnerable to inconsistencies and does not take into account other factors strongly correlated with academic outcomes, such as level of parental education and occupation. However, the reasons that the review provides for why many within the current literature utilize participation in the free/reduced lunch program as a measure of SES is the same as why it is used in this study; the accessibility of the data without the need for the gathering of additional information from parents.

4.4.1.2. Belonging

A student's sense of belonging is defined as the degree to which one sees herself or himself as socially connected within an environment (Walton & Cohen, 2007). Belonging is a mediating variable in this study.

The Academic Belonging Scale (Cook et al., 2012) was adapted for middle-schoolers from Walton and Cohen's (2007) Academic Fit Scale. In personal correspondence with Dr. Walton (April 1, 2016), he suggested the use of the Academic Belonging Scale (Cook et al., 2012) for middle school students. This scale measures the constructs of both social belonging and the potential to succeed in school by asking students to rate the degree to which they agree with a statement as quantified on a scale of one (strongly disagree) to six (strongly agree). An example of one of these questions is, "I feel like I belong in my school" (Cook et al., 2012). This scale can be found in Appendix A. This self-reported measure was administered to students pre and post intervention with students having an unlimited amount of time to complete it.

4.4.1.3. Self-Efficacy

Self-efficacy is defined as the belief in one's capability to successfully complete a given task (Bandura, 1997). In terms of academic learning, self-efficacy is an ongoing process in which the learner continually assesses the task in relation to his or her own efficacy (Schunk, 1991). Self-efficacy is a mediating variable in this research.

Self-efficacy is a multidimensional construct, and as a result, instruments that are domain specific are needed in order to produce valid and reliable measures (Choi, Fuqua, & Griffin, 2001). Self-efficacy within this research was measured by a modified version of the Children's Self-Efficacy Scale, part of the Multidimensional Scales of Perceived Self-Efficacy (MSPSE).

Of the nine domains, the selected items for this research are comprised of three of the domains: Self-Efficacy in Enlisting Social Resources (questions one through four), Self-Efficacy for Academic Achievement (questions five through 11), and Self-Efficacy for Self-Regulated Learning (questions 12 to 18) (Bandura, 2006). Bandura's scale contains 23 survey items within these three domains, and 18 of the 23 were selected to measure self-efficacy (see Appendix A). Items were eliminated based on relevance to the school environment. For example, confidence to "learn algebra" was removed from the Self-Efficacy for Academic Achievement subscale due to the fact that many students will not take the course until high school. One item, "learn to use computers" was modified to "learn to use technology effectively" given the increase in student technological expertise since the scale was published in 2006. For each indicator the student was asked to share their confidence on a scale of zero (cannot do at all) to 100 (highly certain can do). Other examples of survey questions include, "Learn social studies" and "Get myself to study when there are other interesting things to do". Students were given as much time as needed to complete this self-reported measure and it was administered pre and post intervention.

4.4.1.4 Qualitative Investigation of Student Narratives

Additional analysis of the survey data was conducted in order to further uncover themes, areas of concerns, and items that resonate with the eighth grade students in this sample.

4.4.1.5. Academic outcomes: grade point average.

GPA was utilized to measure academic achievement for all eighth graders by averaging their quarters one through four averages in the core classes of English, social studies, math, and science for grades six and seven, and quarter one GPA for core classes in eighth grade. For their sixth and seventh grade years, students were placed into quartiles based on the range of GPA's in

that year. Within this setting, GPA is reported as a percentage rather than on a 4.0 scale. Table 4.8 illustrates the quartiles that this sample were categorized as based on GPA. GPA is the dependent variable in this study.

Table 4.8.

GPA Categorized by Quartiles

	6th Grade GPA	7th Grade GPA
1st Quartile	76.2 - 88.9%	71.8 - 84.9%
2nd Quartile	89 - 93.1%	85 - 90.2%
3rd Quartile	93.2 - 96.2%	90.3 - 94.1%
4th Quartile	96.3 - 100%	94.2 - 99.5

4.5 Hypothesis / Objective

The objective of this study is to determine whether participation in a belonging intervention improves self-beliefs related to self-efficacy and belonging among students as compared to students in a control condition, whether any such differences vary for students of low SES. While it is not feasible in the duration of this study to explore possible impacts on academic outcomes, it is hypothesized that any identified improvements to self-efficacy and belonging might lead to future improvements in academic outcomes. The outcome evaluation summary can be found in Appendix C.

4.6. Evaluation Design

This study employs a quasi-experimental pretest - posttest design with a treatment and control group as described in Shadish, Cook, and Campbell (2002). Sample size was dependent upon the consent/assent return rate.

Once the consent/assent forms were returned, those students' relevant information, including variables such as SES, race/ethnicity, gender, and GPA, were collected by the researcher. The researcher used SPSS to randomly assign students into either the control or treatment group. It was desired to have a percentage of low-SES students in each group that mirrors the low-SES population building-wide (32%), although that threshold was not met due to low response rate for students from a low-SES background.

Consistent with Shadish, et al (2002) the control group was considered a no-treatment group and consisted of both low and typical SES students, which received all other components of a typical eighth grade program with the exception of the intervention. The units of randomization were eighth grade students at Obama Middle School

Once students were randomly assigned via SPSS, the steps outlined for a pretest-posttest control group design in Shadish et al. (2002) were implemented. All students in both the treatment and control groups took an online pretest measuring belonging and self-efficacy (see Appendix A). The scores placed into SPSS were an average score for belonging and three for self-efficacy: Self-Efficacy for Enlisting Social Resources, Self-Efficacy for Academic Achievement, and Self-Efficacy for Self-Regulated Learning. For each student, individual GPA for the two prior years was also entered.

Across two class periods of 41 minutes each, the intervention was administered via Google Classroom, which allows for students within a class to be assigned different

tasks. Students in the treatment group read statements from older students outlining their personal stories of academic struggle and perseverance. These written narratives described their individualized stories of perseverance that reinforces the idea that struggle is normal and success is within their control. Students were then told that select narratives will be shared with the incoming sixth grade students the following summer. Students in the control group followed the same process (read statements from high school students and wrote their own narrative) but with study skills content. The posttest survey, which was also online and is a replica of the pretest, was administered four weeks after the intervention to students in both the control and treatment groups. Belonging and self-efficacy for students in the control and the treatment groups were analyzed. Statistical significance testing was used to analyze whether belonging, and self-efficacy differed between low and high SES students however, the decision was made not to run group difference analysis to determine statistical significance, since the sample size did not warrant that investigation.

4.7 Process Evaluation

4.7.1. Indicators of Fidelity of Implementation

Implementation of the belonging intervention was evaluated along several dimensions to ensure fidelity of implementation; where adjustments were required they are documented. Implementation fidelity is defined as the extent to which the elements of a proposed intervention are implemented as articulated (Nelson, Cordray, Hulleman, Darrow, & Sommer, 2012). As presented by Dusenbury, Brannigan, Falco, and Hansen (2003) there are five components to

measure fidelity of implementation (FoI). (See Table 4.9 for a definition of each and a description of how they will be utilized in this study).

4.7.1.1. Adherence

The first aspect is adherence, or the degree to which the critical components of the intervention are implemented as written. For this particular intervention, students must have read the testimonials of the high school students and create their own written personal narrative of academic struggle and perseverance. Any missing component of the intervention resulted in poor adherence and low implementation fidelity. Conversely, adherence to all of these components resulted in high fidelity.

4.7.1.2 Dose

The second aspect of FoI is dose, or how much of a particular content is administered. In the case of this intervention, dose consists of the number of testimonials read. This measure relied on the self-reporting of students through a short survey via Google Forms. High fidelity consisted of reading four or five testimonials and low fidelity three testimonials or less.

4.7.1.3 Participant Responsiveness

The third aspect is participant responsiveness, defined as to what degree the students involved in the intervention are engaged in the program components. The student self-reporting components of *'to what degree did the activities engage you'*, which were rated on a scale of one (not at all) to three (fully), and how difficult/easy it was for you to think of an instance of academic struggle and perseverance with a scale of one (easy) to three (difficulty). An open-ended question that asks for recommendations for improvement was also asked. Answers of two

or three were considered high fidelity and answers of one represent low fidelity (one: not at all to three: fully).

4.7.1.4 Program Differentiation

The final component is program differentiation, which examines the different components of an intervention and aims to identify their contributions. This intervention was comprised of an exposure and response component. For this study no analyses were planned or conducted to examine different contributions of the exposure to narratives or the writing of the students own' narrative. Therefore this component is not considered further.

Table 4.9.

Aspects of Process Evaluation Fidelity of Implementation adapted from (Dusenbury, Brannigan, Falco, & Hansen, 2003)

Element	Definition	Measure	Fidelity Indicator
Adherence and Program Delivery	The degree to which the critical components of the intervention are implemented as written	Student participation in intervention activities.	High fidelity (HF) = all components for 85% of students Low fidelity (LF) = less than all components for 85% of students
Dose	How much of a particular content is administered	Number of testimonials read	HF = four or five testimonials for 85% of students LF = three or less for 85% of students
Participant Responsiveness	To what degree the students involved in the intervention are engaged in the program components	Student self-reporting survey on Likert Survey; To what extent did the activities engage you	HF = scores of two or three for 85% or more of students LF = scores of one on each question
Program Differentiation	The different components of an intervention and their contributions.	Not relevant for this study	Did the outcomes differ for the treatment and control groups? Did it differ for students of a low vs typical

	SES? HF = Yes LF = No

Chapter Five

5.1. Process of Implementation

Prior to any interaction with students, the researcher met with two key groups of people who were responsible for implementing the intervention: the eighth grade guidance counselor and the three eighth grade English teachers. The meeting with the counselor consisted of reviewing the protocol as submitted to the Internal Review Board (IRB), including the Google Slides presentation that the counselor would show to the eighth grade students at their Monthly Meeting. The meeting between the researcher and the guidance counselor occurred several weeks before the Eighth Grade Monthly Meeting. Several more substantive meetings ensued between the researcher and the three eighth grade English teachers who were the individuals responsible for administering the intervention. During the first meeting we reviewed the protocol as submitted to the IRB. Once teachers were confident in their ability to administer the intervention as intended, there was discussion about the timing of administering the intervention and how it would work within their instructional planning. All three teachers agreed to administer the pre-survey on self-efficacy and belonging the week prior to the intervention with the intervention to be administered the following week over two class periods. Additional details were discussed and decided upon, such as the establishment of a new Google Classroom for the entire eighth grade, with the researcher and the three English teachers as 'teachers' in the virtual classroom, which would allow all four individuals to assign work to students and to view student

work products. It was also reviewed and agreed upon at these meetings that all eighth grade students who had these three teachers would take part in the pre and post surveys and either the belonging or study skills activities regardless of having provided consent/assent, given that these activities are part of the eighth grade curriculum. Although all participated, only the data for those who provided consent/assent was used for this research. Other logistical issues were discussed at the meetings with the eighth grade English teachers, including collection of the consent/assent forms, the timing of the post-survey, and the creation of the surveys in a Google Form separate from the Google Classroom, which would allow for more secure collection of the data.

Once the planning details were decided upon, arrangements were made with the middle school principal and assistant principal for a portion of time during the upcoming monthly meeting. The day of the meeting, the eighth grade guidance counselor shared the IRB-approved Google Slide presentation with the students while teachers and aides present distributed the consent/assent forms. Student questions were answered by either the English teachers or the guidance counselor. Consent/assent forms were collected by the eighth grade English teachers and handed directly to the researcher. The English teachers frequently reminded their students to bring in the forms through in-class and electronic reminders. This was especially important given that a seven school day break occurred between the dissemination of the forms and the due date.

5.2. Findings

5.2.1 Outcome Evaluation

Table 5.1 displays pre/post survey results for belonging and the three measured components of self-efficacy. There was a lack of a treatment effect found for the belonging intervention using these instruments. To elaborate, Research Question 4.1: Is participation in the belonging intervention related to student outcomes in terms of belonging? Table 5.1 shows the mean difference for the treatment group is .02, with the mean difference for the control group at a .01. These results do not warrant the further analysis of the belonging data. Research Question 4.2: Is participation in the belonging intervention related to student outcomes in terms of self-efficacy? First, Self-Efficacy for Enlisting Social Resources shows a mean difference pre/post of .86 for the treatment group and 1.19 for the control group; a mean difference pre/post of -3.35 for the treatment group and -.97 for the control group for Self-Efficacy for Academic Achievement; and finally, a mean difference for Self-Efficacy for Self-Regulated Learning of -1.72 for treatment and -0.2 for control.

Table 5.1.

Mean Difference Pre and Post-Intervention

	Control Pre-test Mean (SD)	**Control Post-test Mean (SD)**	**Diff-erence**	**Treatment Pre-test Mean (SD)**	**Treatment Post-test Mean (SD)**	**Diff-erence**
Belonging	4.74 (.56) n=36	4.94 (.67) n-36	.02	4.77 (.624) n=35	4.64 (.618) n=35	-0.13
SE for Social Resources	81.1 (13.92) n=36	82.29 (14.8) n=35	1.19	71.92 (13.8) n=35	72.78 (16.8) n=35	.86

SE for Acad Achieve	89.67 (7.7) n=35	88.7 (8.67) n=35	-0.97	82.95 (10.15) n=35	79.6 (10.89) n=34	-3.35
SE for Self-Regulated	81.68 (14.82) n=36	81.48 (14.98) n=36	-0.2	72.67 (15.27) n=35	70.95 (16.67) n=34	-1.72

Table 5.2 presents the results of an ANCOVA comparing controls for the differences in post-intervention scores between the treatment and control groups controlling for the pre-test. There is a significance level of .015 for the Self-Efficacy for Academic Achievement subscore. No other measures were found to show significant differences.

Table 5.2.

Difference in Pre and Post Intervention Means Controlling for Pre-Test (ANCOVA)

	Treatment			**Control**			
Post-Score Measure	**n**	**M**	**SD**	**N**	**M**	**SD**	**Difference in Post for Treatment and Control (controlling for pretest)**
Belonging	35	4.64	.618	36	4.94	.67	.058
SE for Soc Resources	35	72.78	16.82	35	82.29	14.836	.140
SE for Acad Achieve	34	79.6	10.89	34	89.26	8.14	.015*
SE for Self-Reg Learn	34	70.95	17.67	36	81.48	14.98	.209

* $p < .05$

Research Question 4.3 asked, Is participation in the belonging intervention related to student outcomes in terms of academic performance? Due to the duration of the study, it is not reasonable to expect changes in academic performance within the time frame of conducted measurements. Research Question 4.4, asked, is the relationship of the intervention moderated by

SES status? Results specific to low-SES students are not discernible due to the poor return of consent/assent forms for low-SES students.

5.2.2 Process Evaluation Findings

Two of the three elements of Fidelity of Implementation (FoI), adherence, dose, and participant responsiveness were administered with high fidelity, as evidenced by the survey data and the digital availability of the written testimonials produced by students.

Table 5.3.

Fidelity of Implementation

Fidelity of Implementation Element	Measure	Results	High Fidelity Y/N
Adherence and Program Delivery: The degree to which the critical components of the intervention are implemented as written	Completed all activities	96% N = 71	Y
	Did not complete all activities	4% N = 3	
Dose: Number of Testimonials Read	Four or Five	91.5% N = 65	Y
	Three or less	8.5% N =6	
Participant Responsiveness: To what extent did the activities engage you?	1 - Not at All	19.7% N = 14	
	2 - Somewhat	64.8% N = 46	Y
	3 - Fully	15.5% N = 11	Y

5.2.3 Workload Weighs on the Mind of Students

Some unexpected themes emerged from the survey data that were not directly related to the survey questions. A closer examination of the pre-intervention survey began with analysis of the open-ended questions at the conclusion of the survey, which were separate from the Children's Self-Efficacy Scale (Bandura, 1997) and the Academic Belonging Scale (Cook, Purdie-Vaughns, Garcia, & Cohen, 2012). A summary of these results is displayed in Tables 5.4 and 5.5. The mean pre-test scores of all students in the sample (n=74) were calculated for the purposes of this next series of analyses.

An unexpected theme that emerged was that 70% of students listed a challenge or concern of an academic nature ("The biggest challenge is school work and with all of the other activities, it can be hard to get everything done" and "The greatest challenge … that I have faced as I get older is the increasing workload") yet Self-Efficacy for Academic Achievement was the highest subscore on the scale with a mean score of 86.84. This tells the researcher that while students may see academics as their greatest challenge, they demonstrate the self-efficacy to succeed. This translates further to a discussion about workload. Students demonstrated a mean score of 86.84 on the aforementioned subscale, it can be logically concluded that students possess the efficacy to do well academically. However, the comments themselves speak not to the difficulty of the work but instead to the volume of it: being able to get homework done and having too much work overall to do. This is also surprising to the researcher given that it was anticipated at the beginning of this study that social concerns would be most prevalent, however, this does not seem to be the case based on these survey results.

Delving further into the academic concerns realm, homework also emerged as a relatively prevalent concern among eighth graders, with 21 out of 74 students, or 28.4% of participants explicitly naming homework as either part of or their entire concern. This is a surprise to the

researcher, since this feedback has not formally been shared with the researcher in her former role as principal of this school or in her current Central Office role. This unexpected result serves as a reminder to conduct actual interviews with high school students in the same context in addition to using the professional expertise gained from the time that the researcher has spent in this context.

Table 5.4.

Academics Weigh on the Mind of Students- Open-Ended Question Data

Area of Pre-Intervention Survey	**Question**	**Category**	**Frequency / Percentage of Sample**
Open-Ended	What is the greatest challenge that you have faced so far?	Academic Challenge	52 Students / 70%
		Management	6 Students / 8%
		Stress (general)	5 Students / 6.75%
		No Challenge Listed	5 Students / 6.75%
		Peer Issue	4 Students / 5.4%
		Teacher Issue	2 Students / 2.7%

Table 5.5.

Mean Pre-Survey Belonging and Self-Efficacy Scores for All Students in the Sample

Measure	**Mean Score / N**
Belonging	4.17 (N=74)
Self-Efficacy for Enlisting Social Resources	76.25 (N=74)
Self-Efficacy for Academic Achievement	86.84

	(N=74)
Self-Efficacy for Self-Regulated Learning	77.3 (N=74)

5.2.4 Moderate Self-Efficacy in Management of Academic Behaviors

Students reported a mean of 77.3 on the subscale of Self-Efficacy for Self-Regulated Learning, which was eight scale points lower than Academic Achievement. Although this subscore was lower, only 8% of students in the sample listed a management issue in the open-ended question section of the survey ("How difficult it is to get through the eighth grade hallway" and "Getting to my classes on time") as their greatest challenge. The 'Management' category of the open-ended questions is most closely related to Self-Efficacy for Self-Regulated Learning subcategory ('Plan my schoolwork for the day' and 'Remember information presented in class and textbooks'). Although students may not list these kinds of academic behaviors as their greatest challenge, the self-efficacy subscale shows that they are feeling only moderately efficacious in this category. More research is needed to see if students have the skills to be self-regulated learners, as this will become even more important as these eighth graders transition to high school. This research could include staff being surveyed as to their perception of student self-regulation behaviors.

5.2.5 Students are Comfortable Getting Help from Peers More Than Adults for Social Issues, but Report Similar Scores for Soliciting Help from Peers and Adults for Schoolwork

Another surprising theme came from where students seem comfortable getting their assistance from. Two items on the Self-Efficacy for Enlisting Social Resources subscale, 'Get teachers to help me when I get stuck on schoolwork' and 'Get adults to help me when I have

social problems' had a lower mean score than their student-like counterparts of 'Get another student to help me when I get stuck on schoolwork' and 'Get a friend to help me when I have social problems'. This survey data is supported by the second open-ended question, which was 'What do you consider the best part of your middle school experience so far'? Students responded to this question with a variety of responses, however, 31 students, or 42% of the participants listed 'friends' as a highlight. This is not all that surprising given that peers gain influence during the developmental time period of middle school, but it was interesting that students reported a mean efficacy rating of 80 or higher when asking peers for help. Another notable theme in the data is the type of issue that students felt comfortable going to their teachers for; they could approach teachers for assistance on schoolwork but felt less comfortable when it came to social issues. Table 5.6 illustrates the four specific questions and their corresponding score below.

Table 5.6.

Further Analysis of the Children's Self-Efficacy Survey

Scale Question	Mean Score
'Get teachers to help me when I get stuck on schoolwork'	82.45
'Get another student to help me when I get stuck on schoolwork'	84
'Get adults to help me when I have social problems'	60
'Get a friend to help me when I have social problems'	79

5.3 Conclusions

Based on the multiple analyses, there was no treatment effect found for belonging or two of the three subcomponents of self-efficacy using these instruments at this point in time. However, a statistically significant result was found for Self-Efficacy for Academic Achievement with the control condition showing more positive change than the treatment group. Initial research questions regarding SES and GPA were unable to be answered for the purposes of this dissertation. Unexpected themes emerged from analysis of the qualitative data and considering them in relation to the quantitative findings and from consideration of the descriptive results for the survey findings. Eighth grade students in this sample exhibited unexpected types of belonging and self-efficacy. There was a small difference in students feeling more comfortable going to a peer to ask for homework than a teacher (M=1.55), however, students reported a much higher degree of comfort in seeking a peer's assistance with a social issue (M=19). The results unexpectedly suggest that peer to peer relationships are strong and that student to teacher relationships could be strengthened for areas outside of academics. Qualitative analysis of the open-ended survey questions uncovered academic workload as a notable concern among students, which was interesting when juxtaposed with the relatively high scores on the Self-Efficacy for Academic Achievement subscale. This leads the researcher to believe that it is not as much the content of the work assigned, but rather the volume of the work that presents a challenge for students.

5.4 Discussion

5.4.1 Limitations and Recommendations for Research and Practice

The first limitation has to do with the sample size of low-SES students who provided consent/assent to participate in the study. Only seven students or 9% of the sample were

classified as being from a low-SES background, which is well-below the overall 29% low-SES representation in the eighth grade class. This small sample resulted in insignificant power and the inability to answer RQ 4.4: *Does participation in the proposed belonging intervention moderated by SES status?* There are several hypotheses as to why the response rate was so low for the overall grade and for students of a low-SES. First is that the consent/assent forms were disseminated immediately before and after the holiday break. Second, there has been a massive opt-out movement in regard to the New York State Assessments within the last five years. Teachers shared with the researcher that it is very possible that this 'opt-out' mentality shifted over to this activity. Other possibilities include students may not have brought home the forms, parents did not check their email with reminders from teachers, or parents did not want their student's data shared. It is interesting that the response rate for the intervention, which was solicited December - January, was only slightly higher than the needs assessment recruitment from the spring of 2016 with a different cohort of students, which occurred in May - June.

Another limitation is that there is no measure of effort included in this study. In theory, if belonging or self-efficacy improve, what type of behavior changed that could potentially impact student outcomes such as GPA? Although the results of this study at this time was inconclusive in terms of its relationship to GPA, a 'black box' still exists as to what behaviors could or did change as a result of improved self-efficacy or belonging. Since belonging interventions seem to harness a snowball effect wherein small initial behavior changes by the student lead to cumulative benefits when those changes are sustained, documenting such effort related changes are likely to be important.

The next limitation has to do with timing and duration. Timing in the belonging literature is important, with recommendations for interventions early in the academic year, as a way to

counter the recursive cascade of poor performance being connected to self-beliefs about belonging and efficacy. However, difficulty in the IRB approval process resulted in the intervention taking place in January instead of September. The literature suggests it is possible that this intervention would have been more successful if it were implemented in the beginning of the school year. They second part to this limitation has to do with duration. This intervention lasted only one month for the purposes of this dissertation. Within that limited amount of time it is unrealistic to be able to see an impact on student learning in the for of GPA, rendering it impossible to answer RQ 4.3: *Does participation in the proposed belonging intervention impact academic performance?* However, it is the intent of the researcher to collect data on this cohort of students for their transition into ninth grade during the 2019-20 school year.

The researcher plans on continuing to collect data into this cohort of students' ninth grade year. A recommendation for practice is that this work be replicated in the same community with an implementation date early in the school year. The teaching staff is interested and with this pilot experience as a foundation implementation can be improved.

It is notable that 84.5% of participants found it 'somewhat easy' or 'easy' to think of an example to share with younger students. The use of Google Classroom assisted in the implementation of this intervention, including the ability to digitally assign the two different types of narratives to the treatment and control groups and for the three eighth grade English teachers to have access to the narratives in addition to the researcher. The mode of administering surveys and tasks seemed relatively easy to implement at the local level and produced a local database of survey and written feedback for the OMS staff to examine.

In reflecting on the narratives, two strengths were that all narratives contained a story of struggle and triumph and were specific to the context as recommended by Walton et al. (2017).

However, more of an emphasis could have been made on how these skills were beneficial in high school. Further, the narratives may have been more effective if the students listed were closer to the age of the students who received the intervention, such as in ninth grade as opposed to eleventh or twelfth. It is possible the content for both the treatment and control groups could have been strengthened by conducting interviews with high school students to more accurately reflect the current thinking of students. Given the high proportion of students who indicated they found somewhat easy or easy to identify an example to share it is recommended that the narratives produced by students during this intervention also be considered a resource for the development of other narratives in the future.

The Fidelity of Implementation analysis conducted here is not typically included in reports of belonging interventions. Another recommendation for research is that such information be included as it may facilitate the adoption and implementation of such interventions where warranted and can shed light on logistic challenges. Additionally, the inclusion of open-ended questions that provide some insight into student experiences of relevance to the intervention target areas is not typically included in related studies. Further inquiry in these areas is also recommended.

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Appendix A: Evaluation Instrument

Obama Middle School Student Survey

Hello! Thank you for agreeing to take this survey. We have chosen several questions/statements that we hope you will assess in an open and honest way. There are no right or wrong answers! From your input, we hope to learn more about how you feel about yourself as a learner and how you feel about your place in the [redacted] Middle School community. Once we know how you feel, we will be able to do some things to help you reach your academic potential and to help you feel like [redacted] Middle School is a place where we all belong and can be successful. All of your answers will be kept confidential.

Academic Belonging Scale

(Cook, Purdie-Vaughns, Garcia, & Cohen, 2012)

Part I: Read the statements on the left and select one box that best describes how you feel about the statement. Select one box on the scale below from 1 (strongly disagree) to 6 (strongly agree).

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
	1	2	3	4	5	6
People in my school accept me.						
I feel like I belong in my school.						
I feel like an outsider at [redacted] Middle School.						
I feel comfortable in my classes in my school.						
People at [redacted] Middle School are a lot like me.						
I know what I need to do to succeed at [redacted] Middle School.						
I do <u>not</u> know how to get a teacher at [redacted] Middle School to like me.						

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
	1	2	3	4	5	6
I am the kind of person that does well in my school.						
If I wanted to, I could do very well in my school.						

Children's Self - Efficacy Scale (modified)

Bandura, 2006

Part II: Rate your degree of confidence by recording a number from 0 to 100 using the scale below.

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all					Moderately can do					Highly certain can do

Confidence (0 to 100)

1. Get teachers to help me when I get stuck on schoolwork _____
2. Get another student to help me when I get stuck on schoolwork _____
3. Get adults to help me when I have social problems _____
4. Get a friend to help me when I have social problems _____
5. Learn math _____
6. Learn science _____
7. Learn reading, writing, and language skills _____
8. Learn to use technology effectively _____
9. Learn a foreign language _____
10. Learn social studies _____

11. Learn English grammar _____

12. Finish my homework assignments by deadlines _____

13. Get myself to study when there are other interesting things to do _____

14. Always concentrate on school subjects during class _____

15. Take good notes during class instruction _____

16. Plan my schoolwork for the day _____

17. Organize my schoolwork _____

18. Remember information presented in class and textbooks _____

Short Response Questions

19. What do you consider the best part of your [redacted] Middle School experience so far?

20. Please describe the greatest challenge you have faced at [redacted] Middle School so far. List anything that we can do more of or differently to help you be successful.

Appendix B: Consent / Assent Forms

Protocol Number:
Student Participant Code:_____
Instructor Participant Code:_____

Johns Hopkins University
Homewood Institutional Review Board (HIRB)
Parental Informed Consent

Title: Student Belonging and Self Beliefs

Principal Investigator: Dr. E. Juliana Paré-Blagoev
Student Investigator: Ms. Michelle Gosh

Date: November 2018

PURPOSE OF RESEARCH STUDY:
The purpose of this research study is understand the potential impact of hearing and reflecting on stories about older student's experiences on your student's academic success as well as on their feelings of connection to the school, and their beliefs about their own ability to achieve.

PROCEDURES:
There will be several components for this study:

1) Students will complete a survey about their feelings of connection to the school and their beliefs about their own ability to achieve in school. This survey will be administered no more than four times: once in the beginning of the 8th grade school year prior to the intervention beginning (during the second quarter), once at the end of the first quarter (also the second quarter), once in the Spring of 2019 (middle of fourth quarter) and once at the end of quarter one of 9th grade (November, 2019).
2) Existing information on your student's prior academic performance (Grade Point Average (GPA), Reading Inventory, Math Inventory) will be gathered by the Student Investigator (Michelle Gosh).
3) Existing demographic information may be used, such as free/reduced lunch status, gender and/or ethnicity. This will be done to help understand how different groups may be impacted by the two different types of activities.

Time required of each student: There is no additional time for students to participate in this study. All activities during the 8th grade are part of the eighth grade curriculum, a final survey

collected in 9th grade will be administered during study hall. To help us understand whether there are different outcomes for the two approaches, students will be randomly assigned into one of two groups: one group will read stories and complete activities that focus on study skills and the other will read stories and engage in activities that focus on academic struggles and perseverance. Agreeing to participate in this study allows for data to be collected in an anonymous manner. A coding system will be used so that no personally identifiable information is visible to anyone other than the Student Investigator.

RISKS/DISCOMFORTS:

There are no anticipated risks to students.

BENEFITS:

Potential benefits are a better understanding of the link between how students feel about themselves as learners and the corresponding effect on their academic achievement, as well as the degree to which a student feels a part of the [redacted] Central School District community and the corresponding academic impact.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your student's participation in this study is entirely voluntary. You choose whether to allow your student to participate, and your student will indicate below whether he or she agrees to take part in the study. If you decide not to allow your student to participate, or your student chooses not to participate, there are no penalties, and neither you nor your student will lose any benefits to which you would otherwise be entitled. Although teachers are collecting the returned forms, they will not to check whether or not consent is being given, as they will be handing the forms to the student investigator. Agreement to participate in the study will be indicated through your signature at the bottom of this form.

You or your student can stop participation in the study at any time, without any penalty or loss of benefits. If you want to withdraw your student from the study, or your student wants to stop participating, **please contact Michelle Gosh via phone or email: (845) 279-8000, [redacted]@jhu.edu or mgosh@[redacted]org**.

CONFIDENTIALITY:

Any study records that identify you or your student will be kept confidential to the extent possible by law. The records from your student's participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the Office for Human Research Protections. (All of these people are required to keep your identity and the identify of your student confidential.) Otherwise, records that identify

you or your student will be available only to people working on the study, unless you give permission for other people to see the records.

All data will be examined by the Principal Investigator and research affiliates only (including those entities described above). No identifiable information will be included in any reports of the research published or provided to school administration. A participant number will be assigned to all surveys and the student's achievement scores and demographic information.

Surveys will be collected in electronic format. Survey data completed electronically will be collected via a password protected Google Form. If the student is unable to complete the surveys electronically, paper copies will be provided. In both electronic and paper format, these data will not include identifiable information.

All research data, including any paper surveys, will be kept in a locked office. Electronic data will be stored on the SI's computer or a secure online space (Google Docs), which is password protected. Any original tapes or electronic files will be erased and paper documents shredded, two years after collection. Only group data will be included in publication; no individual data will ever be published.

COMPENSATION:

Your student will not receive any payment or other compensation for participating in this study. However, students who return this signed form, regardless of whether of whether consent is provided will be given a Bear Buck.

IF YOU HAVE QUESTIONS OR CONCERNS:

You and your student can ask questions about this research study at any time during the study by contacting **Michelle Gosh via phone or email: (845) 279-8000, [redacted]@jhu.edu or mgosh@[redacted].org.**

If you, or your student, have questions about your student's rights as a research participant or feel that your student has not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

Please review and return the next page only indicating whether you do or do not provide consent.

SIGNATURE PROVIDING CONSENT

YOUR SIGNATURE IN THIS SECTION MEANS:

Your signature below means that you understand the information in this consent form.
Your signature also means that you agree to allow your student to participate in the study.
By signing this consent form, you and your student have not waived any legal rights your student otherwise would have as a participant in a research study.

If you <u>would like</u> to participate:

_____

Student Name (please print clearly)

_____

Student Signature (to indicate student assent please sign here OR on the student assent form which has also been provided)

_____

Signature of Parent or Legal Guardian **Date**

_____

Signature of Person Obtaining Consent **Date**
(Investigator or HIRB-Approved Designee)

YOUR SIGNATURE IN THIS SECTION MEANS:
Your signature below means that you understand the information in this consent form.
Your signature also means that you DO NOT wish for your student to participate in the study.

If you <u>would not like</u> to participate:

_____

Student Name (please print clearly)

_____

Student Signature (to indicate student would not like to participate please sign here)

_____

Signature of Parent or Legal Guardian **Date**

_____

Signature of Person Obtaining Consent **Date**
(Investigator or HIRB-Approved Designee)

Appendix C: Summary Matrix: Outcomes

Indicator	Role of Indicator	Data Source(s)	Frequency	Responsibility
Grade Point Average (GPA)	Outcome	Local database	Beginning of eighth grade (sixth and seventh grade GPA)	This researcher
Gender	Control variable	Local database	One time at initial data collection	This researcher
Race/ ethnicity	Control Variable	Local database	One time at initial data collection	This researcher
Student belonging	Mediating variable	Belonging scale self-assessment by the student administered via Google Classroom	Once prior to the intervention and once at the conclusion of the intervention (given to both the treatment and control group at these intervals)	English teacher / This researcher
Student self-efficacy	Mediating variable	self-efficacy scale self-assessment by the student administered via Google Classroom	Once prior to the intervention and once at the conclusion of the intervention (given to both the treatment and control group at these intervals)	English teacher / This researcher

Appendix D: Intervention and Control Narratives, Directions for Writing Task

The following short narratives are taken from older students and describe something that they consider important about their academic experience. Please read each narrative. As you are reading, think about some of your own experiences so far. After reading, we will ask you to write about your own experiences and with your permission, share the best ones with incoming sixth grade students at next summer's orientation.

Note: Many themes are taken from the exemplars in The Social- Belonging Intervention: A Guide For Use and Customization (Walton, Murphy, Logel, Yeager, & The College Transition Collaborative, 2017).

Belonging Narrative #1: Amy, 11th grader

"I really like going to school in [redacted]. But sometimes I also worry that I might be different from other students. It can sometimes feel like everyone else always fits in, and I'm not sure that I always do. But at some point when I was in eighth or ninth grade, I realized that almost everyone comes to school unsure whether they fit in or not. It's ironic— everybody comes to school and feels they are different from everybody else when, really, we all have the same worries. Since I realized that, my experience in school has become more positive and fun."

Belonging Narrative #2: Julio, 12th grader

"Even though things have been tough at times, I've had good experiences here overall. I have a small group of good friends and have been able to take some classes that interested me and made me work hard. I do remember really struggling when I had to take my first Regents course though and thinking that I wasn't really strong in science and was worried that I wouldn't pass. It took me until the middle of the year to realize that I needed to ask my teacher for help. I would go and see him during I/E period and even stayed after school a bunch. At the time I would have rather hung out with my friends in SSR, but I'm really glad that I went for extra help. It made me realize that not every class would come easy and that I would have to put more effort in at some points. At the end of the year not only did I pass, but I got a really good grade on the Regents. I was glad to have learned that lesson early on."

Belonging Narrative #3: Danny, 10th grader

"I felt like the older I got, the more serious my teachers were, and I had heard that they graded harder. But after I sat in their classes and got to know them, I realized that them being serious was more about pushing me to do better than anything else. I'm not saying that I always loved being challenged and feeling like I wasn't getting things right away, but it worked out better in the long run. Those classes that I felt like I struggled in and worked harder in are some of my favorites."

Belonging Narrative #4: Ariana, 12th grade
Compared to other students, I worried that I hadn't worked that hard when I was younger and was anxious about taking harder courses. Before my eighth grade year, I didn't worry much about classes and grades, but remember someone telling me that some of the courses that we took that year would show up on my high school transcript. It was a learning experience. After blowing a big test, handing in projects late and getting completely stressed out, I worried that I wasn't smart and wouldn't do well. Fortunately, I happened to talk to one of my brother's friends who told me that everyone struggles in school at some point - it's just a matter of when and how you work through it. I started to work on things early and not wait until the last minute, and I actually started studying. I also learned to ask for help when I needed it, which was a big step for me. It made a difference. Even though I still have a hard time in school at different points, I know I can reach out to get help and can change some of my habits to be more successful.

Belonging Narrative #5: Emily, 11th grader

"So looking back, my experience in [redacted] was pretty mixed. I mean, socially, it was up and down. I had different friend groups in middle school and high school, and it took some tough experiences to learn that some friends weren't the best for me. There was also some stress when it came to classes. I remember challenging myself by taking this one class that I knew would be a stretch. I didn't feel like I belonged there - I thought that everyone was way smarter than me. We had to work in groups a lot for projects and I got to know some people that I wouldn't have normally hung out with. Once I got to know some of these other kids, I realized that they sometimes doubted themselves too, like even though I thought they were way smarter than me, they sometimes didn't see themselves that way. I guess what I'm saying is that everyone at some time in their lives wonders if they are good enough at something, and just knowing that we all feel that way makes me feel better, gets me to try harder and make it happen."

Note: Control narratives, focused on study skills, are modified from Walton, Logel, et al., (2015) and described in The Social- Belonging Intervention: A Guide For Use and Customization (Walton et al., 2017).

Control Narrative #1: Tara, 11th grade

“When I first got to eighth grade, I had trouble absorbing all of the material in some of my textbooks. I realized that one thing I could do was to do all the practice problems a week or two before the test. That way if I still had questions about the material I could go to the teacher. When I did that for a bunch of tests, it worked. It was hard to get my act together a week ahead of time, but it did paid off.

Control Narrative #2: Ryan, 12th grade

“There are a lot of assignments to keep track of in eighth grade and beyond. When there's a lot on your mind it helps to make a list. Sometimes there's just too much to keep track of in your head. I found writing down a bunch of due dates in my planner really helped. I know that some of my friends use Google Calendar and Classroom for reminders too. However you do it, you should figure out a way to keep track of what you owe so that you don’t get behind and hand things in late.”

Control Narrative #3: Julia, 11th grade

“One of the things that you learn as you get older is that it is important to do your work and do it on time. As you get more and more homework and projects, it can be challenging to get it all done, especially if you are involved in sports or clubs or other things outside of school. I learned that when getting ready for a test, you should figure out what the main topics are going to be. Usually the weight of each topic depends on the amount of teaching time spent on it.”

Control Narrative #4: Nick, 12th grade

"I’ve learned that it is not just important how you study, but also where you study. You want to be in a space where there aren’t a lot of distractions. I have a younger brother and we share a room, and he was always interrupting me when I was trying to get work done. So I talked to my mom about it and she keeps him away from me now. Social media can be a big distraction too, so I try to not get on it when I have a really important test or assignment coming up.”

Control Narrative #5: Mateo, 11th grade

“I realized in my first year that if I wanted to get everything done, I need to become a more efficient studier. Learning doesn’t happen simply by stuffing material into your brain; what you learn needs to be integrated with what you already know. That’s why taking a 10-minute break for every 50 minutes of studying helped me to hold information. After my relaxing break, it also

helped to change the subject or task that I was studying to a new one. This way, my brain didn't get tired of absorbing the same material hour after hour."

References

Walton, G. M., Logel, C., Peach, J., Spencer, S, & Zanna, M. P. (2015). Two brief interventions to mitigate a "chilly climate" transform women's experience, relationships, and achievement in engineering. *Journal of Educational Psychology, 107,* 468-485.

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Student Writing Task Instructions

Intervention Group

Thank you for reading the brief narratives from older students. Next, you will write your own narrative that shares advice with younger students.

After reading the stories of others, please think about your own story; what obstacles have you faced and overcome? What lessons have you learned about how to be successful at [redacted] Middle School? What advice would you share with incoming middle school students in terms of academics? How about socially?

Please write a two to three paragraph response to the above questions. Remember, if you give permission, what you write could be shared with incoming middle school students next summer at 6th grade orientation

Student Narrative Instructions
Control Group

Thank you for reading the brief narratives from older students. Next, you will write your own narrative that shares advice with younger students.

After reading the stories of others, please think the following questions: what study skills/techniques have you used that have been successful? What have you tried that has not worked? What tips and advice can you share with incoming middle school students about how to prepare and study effectively for tests and complete projects?

Please write a two to three paragraph response to the above questions. Remember, if you give permission, what you write could be shared with incoming middle school students next summer at 6th grade orientation

Appendix E: Post-Intervention Survey

Academic Belonging Scale

(Cook, Purdie-Vaughns, Garcia, & Cohen, 2012)

Part I: Read the statements on the left and select one box that best describes how you feel about the statement. Select one box on the scale below from 1 (strongly disagree) to 6 (strongly agree).

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
	1	2	3	4	5	6
People in my school accept me.						
I feel like I belong in my school.						
I feel like an outsider at [redacted] Middle School.						
I feel comfortable in my classes in my school.						
People at [redacted] Middle School are a lot like me.						
I know what I need to do to succeed at [redacted] Middle School.						
I do <u>not</u> know how to get a teacher at [redacted] Middle School to like me.						
I am the kind of person that does well in my school.						
If I wanted to, I could do very well in my school.						

Children's Self - Efficacy Scale (modified)

Bandura, 2006

Part II: Rate your degree of confidence by recording a number from 0 to 100 using the scale below.

0	10	20	30	40	50	60	70	80	90	100
Cannot do at all					Moderately can do					Highly certain can do

Confidence (0 to 100)

1. Get teachers to help me when I get stuck on schoolwork _____
2. Get another student to help me when I get stuck on schoolwork _____
3. Get adults to help me when I have social problems _____
4. Get a friend to help me when I have social problems _____
5. Learn math _____
6. Learn science _____
7. Learn reading, writing, and language skills _____
8. Learn to use technology effectively _____
9. Learn a foreign language _____
10. Learn social studies _____
11. Learn English grammar _____
12. Finish my homework assignments by deadlines _____
13. Get myself to study when there are other interesting things to do _____
14. Always concentrate on school subjects during class _____
15. Take good notes during class instruction _____
16. Plan my schoolwork for the day _____

17. Organize my schoolwork _____

18. Remember information presented in class and textbooks _____

Several weeks ago you were asked to read five narratives from older high school students. How many of those did you read?

- Four or Five
- Three or Less

To what degree did the reading and writing activities engage you?

- Scale of one (Not at All) to three (Fully),

How difficult/easy it was for you to think of an example of academic struggle and perseverance?

- Scale of one (Difficult) to three (easy)

Do you have any recommendations for us if we were to ask other students to complete these activities?

Curriculum Vitae

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Research Interests

Middle school-age learners, students from a low-socioeconomic status and the relationship to learning outcomes, the brain and learning

Education

Ed.D. in Mind, Brain, and Teaching, May, 2019 (anticipated). Johns Hopkins University.
Dissertation: Student Belonging and Self-Beliefs

M.S. in Education: Administration and Supervision, 2006. Fordham University.

M.S. in Education: Instructional Technology, 2006. Western Connecticut State University.

B.A. in History, 2001. Marist College.

Certifications

New York State Administrator SAS/SDA
Teacher (Permanent), Social Studies 7-12